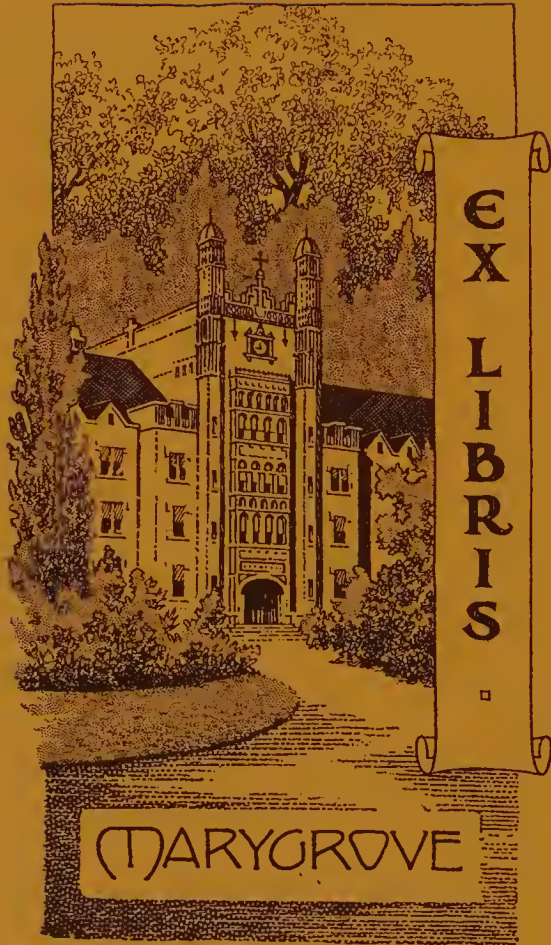


NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

YEARBOOK PUBLICATIONS

PUBLIC SCHOOL PUBLISHING COMPANY
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NATIONAL SOCIETY FOR THE
STUDY OF EDUCATION

Yearbook Publications

VOLUME VI
YEARBOOKS XVII, Part II—XVIII
1918 to 1919

PUBLIC SCHOOL PUBLISHING COMPANY
BLOOMINGTON, ILLINOIS

SUMMARY OF YEARBOOKS XVII, PART II THROUGH XVIII

THE SEVENTEENTH YEARBOOK, PART II (1918)

THE MEASUREMENT OF EDUCATIONAL PRODUCTS

E. J. Ashbaugh, W. A. Averill, L. P. Ayres, F. W. Ballou, Edna Bryner,
B. R. Buckingham, S. A. Curtis, M. E. Haggerty, C. H. Judd,
George Meleher, W. S. Monroe, E. A. Nifenecker,
and E. L. Thorndike

The writers of this yearbook prepared it as representatives of the National Association of Directors of Educational Research (now the Educational Research Association) with the intent "to gather into one handy volume a rather complete statement of the various aspects of a new movement which seems destined to have a profound and permanent influence upon American Education." From the ready reception accorded the yearbook, it is not too much to say that this "rather complete statement" had, itself, a quite considerable influence in furthering the movement for educational measurement. Among the topics considered were: the history of educational measurement, the nature and purposes of such measurement, the organization of bureaus of research, a list of existing tests and scales, an exposition of statistical terms and methods, and suggestions for future development.

THE EIGHTEENTH YEARBOOK, PART I (1919)

THE PROFESSIONAL PREPARATION OF HIGH-SCHOOL TEACHERS

G. N. Cade, S. S. Colvin, Charles Fordyce, H. H. Foster, T. W. Gosling, W. S. Gray, L. V. Koos, A. R. Mead, H. L. Miller, F. C. Whitecomb,
and Clifford Woody

The first 160 pages of this "double number" are devoted to a description by H. L. Miller of the University of Wisconsin plan for the preparation of high-school teachers. Section II contains three chapters by Gosling, Colvin, Koos, and Woody on miscellaneous aspects of the problem of teacher-training. Section III, which the remaining contributors prepared, is a report of the Committee of the Society of College Teachers of Education on Practice Teaching for Secondary Teachers. The volume as a whole thus contains not only important analyses of prevailing conditions in the training of high-school teachers, but also suggestive accounts of several novel experiments looking toward the bettering of the deficiencies found to exist in the preparation of such teachers.

THE EIGHTEENTH YEARBOOK, PART II (1919)

REPORT ON ECONOMY OF TIME IN LEARNING: FOURTH REPORT OF COMMITTEE
ON ECONOMY OF TIME IN EDUCATION

F. C. Ayer, F. N. Freeman, W. S. Gray, Ernest Horn, W. S. Monroe,
C. E. Seashore, and H. B. Wilson

This group of investigators operated as a sub-committee of the committee that was responsible for three preceding yearbooks bearing similar titles. The group took as its task the formulation of rules, or recipes, by which economy could be secured in education, not by better selection of topics for instruction (stressed in the preceding reports), but by improved methods of teaching which had been selected. The yearbook, accordingly, takes the form of a series of statements of fundamental principles which investigation, or the best expert opinion, has shown should be followed in teaching writing, reading, spelling, arithmetic, drawing, and music. This 'meaty' report has been much quoted and decidedly influential.

THE
SEVENTEENTH YEARBOOK
OF THE
NATIONAL SOCIETY FOR THE STUDY
OF EDUCATION

PART II
THE MEASUREMENT OF EDUCATIONAL PRODUCTS

BY
E. J. ASHBAUGH, W. A. AVERILL, L. P. AYRES, F. W. BALLOU, EDNA BRYNER
B. R. BUCKINGHAM, S. A. COURTIS, M. E. HAGGERTY, C. H. JUDD
GEO. MELCHER, W. S. MONROE, E. A. NIFENECKER
E. L. THORNDIKE

Representing the
NATIONAL ASSOCIATION OF DIRECTORS OF EDUCATIONAL RESEARCH

Edited by GUY MONTROSE WHIPPLE, Secretary

This Part of the Yearbook will be discussed at the Atlantic City Meeting of
the National Society, Monday, February 25th, 1918, 8:00 P. M. It
will also be discussed at the Atlantic City meeting of the
National Association of Directors of
Educational Research

PUBLIC SCHOOL PUBLISHING COMPANY
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1918

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EDITOR'S PREFACE

In prefacing Part I of the Sixteenth Yearbook it was stated that the policy of the Society to give preference in its Yearbooks to contributions that would disseminate the reports of important committees in advance of the meetings at which they are to be discussed had been favorably received both by members of the Society and by large numbers of the educational public. It was also stated as "not unlikely that other committees and organizations of men professionally active in various aspects of educational endeavor will be glad to make similar use of the Society's avenues of publication in the future." This expectation has been realized in a most gratifying way in the Seventeenth Yearbook. I wish to congratulate members of the Society on this opportunity to serve themselves as well as the cause of education by cooperating with the National Association of Directors of Educational Research in the publication of the Yearbook these investigators have prepared.

G. M. WHIPPLE.

COMMITTEE'S PREFACE

The National Association of Directors of Educational Research present this Yearbook on Educational Measurement to the superintendents and teachers of American schools, hoping that it may prove of practical value to them in their work. Its purpose is to gather into one handy volume a rather complete statement of the various aspects of a new movement which seems destined to have a profound and permanent influence upon American education. Each chapter has been written by a different member of the Association, and as in any new field of work, complete agreement in either theory or practice is not to be expected, so in this volume the careful reader will detect many evidences of healthy variations in ideals, aims and methods. However, it is believed that these differences are not serious enough to mar the unity of plan and content and that the book as a whole represents the best judgment of the Association as to what information is of greatest practical worth. The Yearbook is issued in the hope that it may further the cause for which the Association stands—the promotion of educational research in American public schools.

The editorial committee, on behalf of the Association, hereby gratefully acknowledges its indebtedness to the National Society for the Study of Education, whose cooperation has made the publication of a yearbook possible.

EDITORIAL COMMITTEE

STUART A. COURTIS, *Chairman*,
LEONARD P. AYRES,
B. R. BUCKINGHAM,

CHAPTER I

HISTORY AND PRESENT STATUS OF EDUCATIONAL MEASUREMENTS

LEONARD P. AYRES

Division of Education, Russell Sage Foundation, New York City

Measurements in education are fifty years old if we count from the oldest beginnings of which we have record. They are twenty-five years old if we reckon from the time that Dr Rice, the pioneer and pathmaker among American scientific students of education, began his work in this field. They are ten years old if we begin our count with the earliest efforts of Professor Thorndike, who is the father of the present movement.

We are indebted to Professor Thorndike for having discovered what is apparently the earliest record of work in the field of educational measurements as we now use that term. As early as 1864 a school master in England, the Rev. George Fisher, of the Greenwich Hospital School, had seen the need and possibilities of standards, and with prophetic foresight anticipated present-day achievements. His practice was as follows: "A book called the 'Scale-Book' has been established, which contains the numbers assigned to each degree of proficiency in the various subjects of examination: for instance, if it be required to determine the numerical equivalent corresponding to any specimen of 'writing,' a comparison is made with the various standard specimens, which are arranged in this book in order of merit; the highest being represented by the number 1, and the lowest by 5, and the intermediate values by affixing to these numbers the fractions $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{3}{4}$. So long as these standard specimens are preserved in the institution, so long will instant numerical values for proficiency in 'writing' be maintained. And since fac-similes can be multiplied without limit, the same principle might be generally adopted.

"The numerical values for 'spelling' follow the same order and are made to depend upon the percentage of mistakes in writing

from dictation sentences from works selected for the purpose, examples of which are contained in the 'Scale-Book,' in order to preserve the same standard of difficulty.

"By a similar process values are assigned for proficiency in mathematics, navigation, Scripture, knowledge, grammar and composition, French, general history, drawing, and practical science, respectively. Questions in each of these subjects are contained in the 'Scale-Book,' to serve as types, not only of the difficulty, but of the nature of the questions, for the sake of future reference; observing that the same numerals are used in the same order as before, viz., number 1 denotes the highest, and number 5 the lowest amount of attainment.

"In respect to the numerical values of 'reading,' as regards accuracy, taste or judgment, it is obvious that no other standard of measurement can be applied, beyond the interpretation of the terms 'good,' 'bad,' 'indifferent,' etc., existing at the period of examination. And the same observation will apply to the estimation of numbers of 'characters' and 'natural abilities,' as determined by the united testimony of the respective masters.

"Having stated this much with regard to the plan pursued in this school, I may well add that the advantage derived from this numerical mode of valuation, as applied to educational subjects, is not confined to its being a concise method of registration, combined with a useful approximation to a *fixed standard* of estimation, applicable to each boy; but it affords also a means of determining the *sum total*, and therefrom the means or average condition or value of any given number of results."¹

Mr. Fisher's efforts seem to have produced no lasting results. Progress in the scientific study of education was not possible until people could be brought to realize that human behavior was susceptible of quantitative study, and until they had statistical methods with which to carry on their investigations. Both of these were contributed in large measure by Sir Francis Galton. As early as 1875 he published scientific studies of the traits of twins, of number-

¹Reported by E. B. Chadwick in the *Museum, a Quarterly Magazine of Education, Literature and Science*, Vol. III, 1864. See also *Journal of Educational Psychology*, Vol. 4, page 551.

forms, of color-blindness, and of the efficacy of prayer. Out of his work came much of experimental and educational psychology, and indirectly, educational measurements. It was he who developed the statistical methods necessary for the quantitative study of material which seemed at the outset entirely qualitative and not at all numerical in nature.

In America the real inventor of the comparative test was Dr. J. M. Rice. Dr. Rice studied in Germany and came under the influence of the German psychologists at Jena and Leipsie. Returning to this country, he became interested in education and one day in 1894 the new idea was born. Of this invention Dr. Rice says: "In truth, however, I came to recognize that this (the claims of school men following different courses of study) was all talk,—that no one really knew the facts, because there were no standards to serve as guides. Then one day, the idea flashed through my mind that the way to settle the question was to try it out. For a beginning I decided to take spelling, and on that very day I made up a list of 50 words with the view of giving them as a test to the pupils of the schools as I went on my tour from town to town. I have no record of the date of the inspiration, but I think it was some time in October, 1894."

Dr. Rice's work, however, did not meet with the approval of the educators of the day. One of his earlier reports in this field indicated that children who had spent thirty minutes a day for eight years in the study of spelling did not at the end of that time spell any better than the children in another school system who had spent only fifteen minutes a day for eight years in the same study. The presentation of these results brought upon the investigator almost unlimited attack. The educators who discussed his findings and those who reviewed them in the educational press united in denouncing as foolish, reprehensible, and from every point of view indefensible, the effort to discover anything about the value of the teaching of spelling by finding out whether or not the children could spell. They claimed that the object of such work was not to teach children to spell, but to develop their minds! It was the issue between the investigator and the formalist in education, and the con-

flict that is still under way is the conflict that was then for the first time clearly defined.

Little by little the more thoughtful men in the field of education appreciated the suggestive value of Dr. Rice's work and some few of them, notably Professor Hanus of Harvard, dared to come to his support. Slowly the tide turned in his favor, until by common consent the general validity of his conclusions was tentatively accepted. His methods, however, were not generally adopted, and for more than ten years but little progress was made beyond the work of the pioneer himself.

If Dr. Rice is to be called the inventor of educational measurement, Professor E. L. Thorndike should be called the father of the movement. In 1895, Professor Thorndike was a student at Columbia, struggling with statistical methods in a course on measurements under Boas, and "finding it new and very hard for me to learn."² His interests were in the field of psychology and the work of Rice made a deep and lasting impression. Gradually his experimental work came more and more into the educational field. He began to preach the need of measurement and to experiment with tests and scales. The Stone Arithmetic Tests were published in 1908. The Thorndike Scale for the measurement of merit in handwriting was presented before Section L of the American Association for the Advancement of Science at its Boston meeting, in December, 1909, and was published in the *Teachers College Record* the following March. The construction of this scale, based on the equal difference theorem formulated by Cattell, marks the real beginning of the scientific measurement of educational products.

During the past ten years the growth of the scientific movement in education has been continuous and rapid. It has been closely related to the survey movement which had its real inception in 1907 in a great social study of the city of Pittsburgh, which was termed "A Survey." Three years later two college professors, Hanus of Harvard and Moore of Yale, conducted studies of the school systems of Montclair and East Orange in New Jersey. These studies differed from earlier investigations of school systems in that their purpose was to tell the public about their public schools, and each

²Quotation from a personal letter.

investigator, borrowing the term from the contemporary social movement, used the word "survey" to designate a section of his report. In the years that have followed, scores of surveys of city, state and county school systems have been conducted, and in ever increasing degree they have utilized, as perhaps the most important of their methods, the scales and tests used in the measurement of educational processes and products.

The two movements were represented in the New York school inquiry of 1911-12. For the first time in a formal educational investigation tests were used as an aid in evaluating the results of public-school work. These were the Courtis arithmetic tests, which had by that time attracted a good deal of attention. Their successful use in the New York survey not only settled all doubts as to the availability of the tests themselves for the measurement of educational attainment, but also firmly established the principle that in conducting school surveys scientific tests must be utilized where they are available.

One of the recommendations of the survey committee in New York City was that a Bureau of Research be established to conduct a continuous survey, from within the school system itself and for its benefit. This recommendation was immediately adopted and the Bureau organized in September, 1913. Previous to this time, there had been in various cities committees and other organizations, which had made studies of various phases of administrative and instructional work, but to New York City probably belongs the credit of first establishing a formal organization having for its purpose the continuous critical study of its own activities by scientific methods.

By this time, Boston, Detroit, and many other cities, were experimenting with measurement and obtaining results of value. Other bureaus were soon established. The Division of Education of the Russell Sage Foundation had turned its attention to work of this type as early as 1907, the Boston Bureau was organized in 1913, and similar organizations in Detroit, Kansas City, and Oakland soon followed. During these same years faith and interest in measurements had been greatly stimulated by the development of the Binet-Simon tests and by the wide-spread attention given the study of retardation and elimination in school systems. A demand for

men trained for the work was created. Superintendents and teachers also were clamoring for technical knowledge of methods and for explanations of the results obtained. For ten years graduates of Teachers College, Columbia University, and of the School of Education of Chicago University had had impressed upon them that measurement and scientific experimentation were highly desirable in education and they had been at least partly prepared for such work. Next, this training was expanded into formal courses in educational measurement. Soon courses in measurement appeared in all the great universities and the movement began to gain full momentum.

The meetings of the Department of Superintendence of the National Education Association afford an excellent index of the progress of the movement. Dr. Rice's report in 1897 was received with derision. The Philadelphia meeting in 1912, after a heated discussion, voted against measurement by a small majority, but two years later a committee on Tests and Standards made a favorable report which was adopted by a considerable majority.

Today tests and scales are used throughout this country and around the world. In England, Germany, and France, before the war, beginnings had been made. Scales for the measurement of Chinese writing and composition are now in process of construction. In Australia and New Zealand, in India and Hawaii, and throughout the length and breadth of the United States and Canada, tests and scales are in daily service, proving valuable tools in the hands of those who know how to use them.

The scientific method is at base analytic scrutiny, exact measuring, careful recording, and judgment on the basis of observed fact. Science in education is not a body of information, but a method, and its object is to find out and to learn how. By its aid, education is becoming a profession. Courses of study are being adapted to the needs of children; teaching effort and supervisory control are becoming more efficient. The center of interest in education has become the child, rather than the teacher, and efforts to improve the quality of instruction begin by finding out what the children can do, rather than by discussing the methods by which the teacher proceeds.

Educational measurement has been accepted by the American public. This Yearbook is in itself a proof of that. That the methods of today are still crude and imperfect must be admitted by even the most enthusiastic supporters of the movement. They deal most effectively with only the simple mechanical skills, and even here they are still far from perfect. Nevertheless, they are extending each year their range of availability and their field of application.

The importance of the movement lies not only in its past and present achievements, but in the hope of the future. Knowledge is replacing opinion, and evidence is supplanting guess-work in education as in every other field of human activity. This is the supreme fact to which this Yearbook bears witness. The future depends upon the skill, the wisdom, and the sagacity of the school men and women of America. It is well that they should set about the task of enlarging, perfecting, and carrying forward the scientific movement in education, for the great war has marked the end of the age of haphazard, and the developments of coming years will show that this is true in education as in every other organized field of human endeavor.

CHAPTER II

THE NATURE, PURPOSES, AND GENERAL METHODS OF MEASUREMENTS OF EDUCATIONAL PRODUCTS

EDWARD L. THORNDIKE

Professor of Educational Psychology, Teachers College, Columbia University

Whatever exists at all exists in some amount. To know it thoroughly involves knowing its quantity as well as its quality. Education is concerned with changes in human beings; a change is a difference between two conditions; each of these conditions is known to us only by the products produced by it—things made, words spoken, acts performed, and the like. To measure any of these products means to define its amount in some way so that competent persons will know how large it is, better than they would without measurement. To measure a product well means so to define its amount that competent persons will know how large it is, with some precision, and that this knowledge may be conveniently recorded and used. This is the general *Credo* of those who, in the last decade, have been busy trying to extend and improve measurements of educational products.¹

We have faith that whatever people now measure crudely by mere descriptive words, helped out by the comparative and superlative forms, can be measured more precisely and conveniently if ingenuity and labor are set at the task. We have faith also that the objective products produced, rather than the inner condition of the person whence they spring, are the proper point of attack for the measurer, at least in our day and generation.

This is obviously the same general creed as that of the physicist or chemist or physiologist engaged in quantitative thinking—the same, indeed, as that of modern science in general. And, in general,

¹The conditions to be thoroughly known must be known as quantities *a, b, c, d*, etc., of qualities, or powers, or skills, or knowledges *A, B, Y, J*, etc.—that is, as an equation $aA + bB + cY$, etc.

the nature of educational measurements is the same as that of all scientific measurements.

In detail, however, there are notable differences. An educational product, such as a composition written, a solution of a problem in arithmetic, an answer to a question about history, a drawing of a house or the performance of an errand, is commonly a complex of many sorts of things. The task of measuring it seems more like measuring a house or an elephant than it is like measuring a length or a volume or a weight. A complete measurement of, say, a composition might include an exact definition of its spelling, its usage of words, its usage of word forms, its wit, its good sense and so on and on; and each of these might again be subdivided into a score or more of component elements.

What we do, of course, is to make not such a complete measurement of the total fact, but to measure the amount of some feature, *e.g.*, the general merit of the composition or the richness of its vocabulary, just as physical science does not measure the elephant, but his height, or his weight, or his health, or his strength of pull. Every measurement represents a highly partial and abstract treatment of the product. This is not understood by some of our critics who object to tests and scales because of their limited point of view. The critic's real point should be that an educational product commonly invites hundreds of measurements, as we all well know. It should be noted also that single measurements are still in a sense complex, being comparable to volume, wattage or the opsonic index, rather than to length, weight or temperature.

In the second place, the zeros of the scales for the educational measures and the equivalence of their units are only imperfectly known. As a consequence, we can add, subtract, multiply and divide educational quantities with much less surety and precision than is desirable. Indeed, in any given case, the sense in which one educational product is twice as good or as desirable as another, or in which one task is twice as hard as another, or in which one improvement is twice as great as another, is likely to be a rather intricate and subtle matter, involving presuppositions which must be kept in mind in any inferences from the comparison.

In some cases so little is known of units of amount that we do not even try to equate distances along the scale, but simply express relative size in terms of arbitrarily chosen units and reference points.² This is the case, for example, with the most commonly used measurement in psychology and education, that due to applying the Binet-Simon tests.

Nobody need be disturbed at these unfavorable contrasts between measurements of educational products and measurements of mass, density, velocity, temperature, quantity of electricity, and the like. The zero of temperature was located only a few years ago, and the equality of the units of the temperature-scale rests upon rather intricate and subtle presuppositions. At least, I venture to assert that not one in four of, say, the judges of the supreme court, bishops of our churches, and governors of our states could tell clearly and adequately what these presuppositions are. Our measurements of educational products would not at present be entirely safe grounds on which to extol or condemn a system of teaching reading or arithmetic, but many of them are far superior to the measurements whereby our courts of law decide that one trademark is an infringement on another.

There are two somewhat distinct groups of educational measurements: one, well illustrated by the Courtis tests, asks primarily how well a pupil performs a certain uniform task; the other, well illustrated by the Hillegas or Trabue tests, asks primarily how hard a task a pupil can perform with substantial perfection, or with some other specified degree of success. The former are allied to the so-called method of average error of the psychologists; the latter, to what used to be called the method of "right and wrong cases." Each of these groups of methods has its advantages, and each deserves extension and refinement, though the latter seems to represent the type which will prevail if education follows the course of development of the physical sciences.

I have so far omitted specific reference to measurements by relative position—the so-called 'order of merit method.' This method, available even where no differences in the amount of the

²That is, as a , $a+x$, $a+x+y$, $a+x+y+z$, etc., claiming only that x , y , and z are all positive quantities.

thing measured are defined, and useful to organize the reports of untrained observers, is doing excellent service as a first stage in quantitative knowledge. For every reason, however, the grading of a set of educational products by relative position should soon give way to their rating by some even rough scale, such as meteorology uses for the cloudiness of days, and such as astronomers use for the magnitude of stars. A very, very simple form of scale, such as almost anybody can use to measure almost any product that he knows anything about, is that devised by Walter Dill Scott for use in rating the achievements or promise of employees.³

The purpose of measurements of educational products is in general to provide somebody with the knowledge that he needs of the amount of some thing, difference or relation. The "somebody" may be a scientific worker, a superintendent of schools, a teacher, a parent or a pupil. He may need a very precise or only an approximate measure, according to the magnitude of the difference which he has to determine. He may need it for guidance in many different sorts of decisions and actions.

Some of the most notable uses concern the values of studies in terms of the changes produced by them, the effects of different methods of teaching, and the effects of various features of a school system, such as the salary scale, the length of the school day and year, the system of examining and promoting pupils, or the size of class. There are many problems under each of these heads, and each of these problems is multifarious according to the nature, age, home life and the like of the pupils, and according to the general constitution of the educational enterprise, some small feature of which is being studied.

Another important group of uses concerns inventories of the achievements of certain total educational enterprises such as our educational surveys must become if they are to carry authority with scientific men. The total educational enterprise may be the work

³The Rating Scale was originally devised and is now issued as one of the copyrighted forms of the Bureau of Salesmanship Research, Carnegie Institute of Technology, Pittsburgh, Pa. A modification of it is in use in certain sections of the military organization of the United States for the selection of men for promotion. A description of this military modification has appeared in *Collier's Weekly*—G. M. W.

of a teacher, of a school, of an orphanage, of a prison, of a system of schools, or the like.

Another important group of uses centers around the problem of giving the individual pupil the information about his own achievement and improvement which he needs as a motive and a guide. It is interesting to note that the first of the newer educational scales, which was expected to be used chiefly by scientific investigators of the teaching of handwriting, now hangs on the wall of thousands of classrooms as a means for pupils to measure themselves. There are many other purposes, and important ones, such as the detection and removal of gross prejudices on the part of teachers in their own evaluations of certain educational aims and products. These, however, cannot be described here.

The superintendents, supervisors, principals and teachers directly in charge of educational affairs have been so appreciative of educational measurements and so sincere in their desire to have tests and scales devised which they can themselves apply, that the tendency at present is very strong to provide means of measurement which are concerned somewhat closely with school achievements, and which can be used by teachers and others with little technical training. There is also a tendency, because of this need for a large number of measurements in the case of educational problems, to try to devise tests which can be scored by persons utterly devoid of judgment concerning the products in question.

It would ill become the present writer to protest against these two tendencies; and they are intrinsically healthy. There is, however, a real danger in sacrificing soundness of principle and precision of result to the demand that we measure matters of importance and measure them without requiring elaborate technique or much time of the measurer. The danger is that the attention of investigators will be distracted from the problems of pure measurement for measurement's sake, which are a chief source of progress in measuring anything. Perhaps not even one person in a million need feel this passion, but for that one to cherish it and serve it is far more important than for him to devise a test which thousands of teachers will employ. Opposition, neglect, and misunderstanding will be much less disastrous to the work of quantitative science

in education than a vast output of mediocre tests for measuring this, that and the other school product, of which a large percent are fundamentally unsound.

We have seen that educational measurements vary from an assignment of a certain amount of some clearly defined thing, the zero, or "just not any," of which is fairly accurately known, to a mere assignment of a certain position in a series of products themselves only similarly defined. They vary also from measurements in the most unimpeachable of units, such as time, to measurements where the unit is "that difference in quality which 75 percent of a certain sort of observers succeed in observing" or is even more crudely and hypothetically defined. They include measures in the form of how well a certain task is performed, and of how hard a task can be performed with a certain degree of success. Consequently, the methods of devising and using educational measurements also vary widely—too widely for any unified exposition. What will be said about methods here will, in fact, comprise only certain recommendations and cautions which are likely to be often appropriate.

Consider first certain principles of method designed to ensure reliable measures, or at least measures whose degree of unreliability is known and can be allowed for. These are:

At least two specimens or samples should be taken of any fact about which a statement is to be made. If any individual's achievement in drawing is to be reported, use at least two drawings. If the achievement of a class in addition is to be reported, use at least two tests, preferably on two days. If the effect of a method is to be estimated, test the method with at least two classes taught by different teachers. If the quality of a specimen of handwriting is to be reported, have at least two judges rate it independently. It will often appear from the comparison of two samplings of a fact that many more samplings are needed to permit a statement that is precise enough for the purpose in view.

No fixed rules can be given, since the purpose in view determines the degree of precision that is required, but it may be noted that a test which gives, for a single pupil, an approximation so rough as to be almost useless, gives for a class of thirty-six a result

which is six times as precise, and for a group of nine classes a result which is eighteen times as precise. Ten times as large a sampling of the product in question is required to measure a single pupil as to measure the average of a hundred pupils (to the same degree of precision). In general, eight tests of 15 minutes each are superior to four tests of 30 minutes each, and still more superior to two tests of 60 minutes each, since the accidents of particular temporary circumstances are thus reduced in influence.

Consider next certain principles of method that need to be observed if we are to secure measures whose significance is certain.

Great care should be taken in deciding anything about the fate of pupils, the value of methods, the achievement of school systems and the like from the scores made in a test, unless the significance of the test has been determined from its correlations. For example, it cannot be taken for granted that a high score in checking letters or numbers is significant of a high degree of accuracy and thoroughness in general. Letter-checking tests have been so used, but with very little justification. Courtis has given reason to believe that a test with stock problems from text-books in arithmetic may be a very inadequate test of ability to reason with quantitative facts and relations, this ability being in such a test complicated by, and perhaps even swamped by, the ability to understand the verbal description of the facts and relations.

A pupil's score in a test signifies first, such and such a particular achievement, and second, *only whatever has been demonstrated by actual correlations to be implied by it*. Nothing should be taken for granted.

The significance of one *ability* (A) for another (B), is given by the correlation coefficient r_{AB} corrected for attenuation. The significance of a *particular test sampling* (A) for the ability (B) is given by the raw correlation coefficient r_{AB} . Thus, arithmetical ability itself is significant to a high degree of promise of ability with algebra and geometry, but a five-minute test in arithmetic would be much less so.

It is unfortunately the case that we do not at present know at all well the significance of any school ability or of any of the tests which we have devised as convenient means of sampling abilities. We need not blame ourselves for this: the educational measurements now in use are much better than none at all. They do excellent service, provided inferences are made with proper caution. They will do still better service in proportion as the correlations of each are determined. This work is extremely laborious, but sound method requires it.

Consider next certain principles of method designed to free measurements from certain pernicious disturbing factors, notably unfair preparation for the test, inequalities in interest and effort, and inequalities in understanding what the task is.

The best protection against unfair preparation is the provision of many alternative tasks of demonstrated equality in difficulty. This again means extremely laborious and uninteresting work, which nevertheless requires expert talent. It should be subsidized.

There is and can be no absolute assurance of equality in interest and effort. Any educational product is a product of ability conditioned by interest. All that we can do is to choose such conditions for the test as are found to reduce inequalities in interest and effort to a minimum (that is, to show high correlations with the composite of results obtained with a sampling of all conditions likely to influence interest). There is reason to believe that, when the test is taken as a part of school work, the appeal to group competition, as in "We wish to find out whether you can do as well as the sixth-grade children in Boston did," and a promise to report the results to each individual, are useful. In the case of high-school and college students a small payment in money or release from tasks, together with the promise of a full report to each individual, seems a useful method.

Inequalities in understanding what the task is, may be reduced by a preliminary trial, identical in form with the test itself, but with very easy content, and by giving special tuition to any pupil who fails in this preliminary trial. Instructions should be in simple language and should always be accompanied by at least three concrete samples of the task.

One who is eager to find imperfections can find many in present measurements of educational products. Nor is it a hard task to make constructive suggestions for improvement. An intelligent student of education could probably in a single day note a score of sure ways of improving the scales and tests which we now use. That is really child's play. The hard thing is the actual expert work of remedying the imperfection, for this involves hundreds of hours of detailed expert planning, experimenting and computing. What is needed in educational measurement is not the utterance by onlookers of criticisms and suggestions with which the men actually at work with measurements are as familiar as they are with their own names, but expert assistance in overcoming the defect.

If those who object to quantitative thinking in education will set themselves at work to understand it; if those who criticize its presuppositions and methods will do actual experimental work to improve its general logic and detailed procedure; if those who are now at work in devising and in using means of measurement will continue their work, the next decade will bring sure gains in both theory and practice. Of the gains made in the past decade, we may well be proud.

CHAPTER III

SPECIFIC USES OF MEASUREMENT IN THE SOLUTION OF SCHOOL PROBLEMS

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In preparing this chapter on the specific uses of measurement in the solution of school problems the writer mailed to a selected group of school superintendents, most of whom were known to have used tests and scales, a questionnaire. Chiefly it was sought to learn what changes in school organization and procedure had been made as a result of such measurement.

Among 200 replies received there were 62 which reported some conscious alteration in the work of the school following the use of a standardized scale or test. In general, these changes may be grouped under six heads as follows:

1. Changes in classification of pupils
2. Changes in school organization
3. Changes in course of study
4. Changes in methods of instruction
5. Changes in time devoted to subject
6. Changes in methods of supervision

Under these same heads it is convenient to group the remedial measures described in the periodical literature, and the discussion to follow will, therefore, make use of this classification. Under each head will be given results of the questionnaire. These results are fragmentary, but serve to indicate the range of things which school officers wisely or unwisely do as a result of information derived from educational measurements. Under each head will also be given one or more detailed examples of the type of remedial work in question. No attempt is here made to give an exhaustive review of the literature. Only suggestive cases are used.

I. CLASSIFICATION OF PUPILS

1. Changes Indicated by Replies to Questionnaire

Changes in classification were of three sorts:

(a) The promotion and demotion of individual pupils who were found improperly classified. "We gave certain pupils double promotions." "We demoted and promoted pupils who did not fit the grade they were in." "Bright pupils were put into relief by the tests and afterwards examined; a large number were promoted thus."

(b) A transfer of pupils from one grade to another for particular subjects. "Pupils were transferred in reading to grades for which the tests revealed they were fitted," "When pupils reached Quality 10, Thorndike handwriting scale, in monthly tests they were promoted into advanced section, meeting three times a week," "Pupils classified in reading according to score in test: (1) those below Kansas Standard drilled in thought interpretation; (2) those who equalled Kansas median given no extra attention; (3) those who tested a grade higher allowed to drop reading for a time and work on any study they were low in."

(c) A general reclassification of entire school. "I classified my school below seventh grade so pupils could make up work where they were weak and take advanced work where they were strong."

2. Detailed Example

In the University of Minnesota High School 60 pupils were accepted at the opening of the school year as beginners in the freshman class. These students were required to take English and general science and had a choice of two of the following: Latin, ancient history, and mathematics. Before the first day of school they were tested, as a group, with the Trabue completion scale, an analogies test, and an omnibus mental test. Later they were tested with Thorndike's reading scale Alpha 2, a series of arithmetical problems, and a wide range of mental and educational tests. The initial tests were given in order to get a measure of the probable success of the several students and to find an intelligible basis for sectioning the group for purposes of instruction. On the basis of the test scores, the students were divided into two or more classes for the several school subjects.

The school marks for these students were given in all by seven instructors; each student was rated by four different teachers. The marks were in letters *A*, *B*, *C*, *D* and *F* and were based upon a relative marking system. In the total marks to be here considered *A* was given to 8.6 percent of the class, *B* to 21.2 percent, *C* to 43.3 percent, *D* to 20 percent and *F* to 6.8 percent. In the work in general science, where two sections were taught by different teachers; the instructors conferred in giving the marks, so that the sixty pupils were rated as a single group. This rating was in large measure on the basis of objective tests which were the same for all. Similar objective tests were used in all subjects.

The marks to be here considered are those given at the end of the first month. These marks, more than those to be given later, are liable to inaccuracy as indicators of ability to do the high-school work. Now, comparing these marks¹ with the scores in the standard tests, what do we find?

The first and simplest measure of prophecy which we wish to find is the median attainment, for sixty pupils can be fairly divided into two sections for high-school instruction. If, by dividing them on the basis of the tests, we get the more capable half in the upper section and the less capable half in the lower section, the prophecy of the tests is confirmed. Figuring the median attainment, we find that the omnibus test placed 72 percent of the sixty pupils in that half of the class in which they were placed by the teachers' marks for the first month. Likewise, the reading scale Alpha 2 placed 72 percent correctly. When the scores of the two tests are combined the median retention is 76 percent. In other words, the tests placed more than seven pupils in every ten correctly before they had done a single day of high-school work.

As a matter of fact, the prognosis was even better than this, for all of the instructors were agreed that the school marks did not represent the abilities of all of the pupils accurately. Thus, one boy of acknowledged ability stood 12 in the omnibus test and 22 in the reading test. In marks he stood 57, scoring *C* in history and failing in general science, mathematics and English. Every one, in-

¹These data are available through the courtesy of Dr. W. S. Miller, Principal of the University of Minnesota High School.

cluding the boy himself, admits that through this month he idled away his time. There is also the opposite type of case—a student scored low in the tests but by unusual industry lifted himself above the median line in marks. When one considers the part which industry plays and the variable factors of outside work, social distractions, parental interests and personal attitudes in relation to school achievement, it is clear that intellectual ability alone is not determinative.

It is encouraging to believe, however, that approximately eight children in ten are properly placed by such tests. This idea is supported by figuring the average mark of the students in the upper and lower halves of the tests. Equating the letters to the figures 5, 4, 3, 2 and 1, it is evident that a student carrying four subjects could score 20 points. As a matter of fact the upper half as divided by reading test scored 13.4 points, while the lower half scored 10.3, and similar figures for the two groups as divided by the omnibus test are 13.5 and 10.2. If we divide the sixty pupils into three equal groups on the basis of the two tests, the upper third averages 14.2 in marks, with no failures in a total of eighty marks. The lower third averages 9.8 with 17 failures in a total of eighty marks and only 9 marks above *C*.

Reasoning from all these data, it is safe to say that both educational and mental tests may be used to classify students for purposes of instruction; that a few hours spent in preliminary examination will foreshadow later achievements to a high degree. Admittedly, much technique remains to be developed, but the promise is sure. Superior students can be detected and grouped together; mediocre students can be put with mediocre students, and weak students, instead of being submerged in the struggle to maintain standing, can receive the help they need. It would be difficult to overestimate the increase of efficiency that would come from the better adaptation of instruction in consequence of such classification.

How dependable the tests really are in promoting superior students is evidenced by numerous instances, of which the following may serve as an example:

Robert was 12 years old, beginning second semester of eighth grade. His teachers reported him indifferent, doing only ordinary work and inclined to be the center of schoolroom disorder and organized insurrection. Parents noted that, though previously much interested in school, the boy now disliked to attend; he disliked the teachers and wanted to drop out. Robert insisted that the studies were not interesting, that he knew all he wanted to know about them already. Mental examination showed an intelligence quotient of 142, a mental age probably greater than that of some of his teachers, who bored him to death by treating him as an ordinary twelve-year-old. He was recommended to high school, entered three weeks late, led his class at the end of six weeks and at every subsequent interval when marks were given. More important, his whole attitude toward school was changed, because the advanced work was a real challenge to his mental ability.

II. SCHOOL ORGANIZATION

1. Changes Indicated by Replies to Questionnaire

Seven types of change in school organization were indicated as follows:

(a) Change in size of classes. "Smaller classes in arithmetic." "More teachers in arithmetic." "The services of additional teachers demanded for defectives in industrial training." "Enlargement of class for defectives."

(b) Division of classes into special sections. "An advanced and a special section made in writing on the basis of errors."

(c) Organization of Special Classes. "Opened special room for backward pupils." "Organized special corrective work."

(d) Departmentalization. "Departmentalization of sixth, seventh, and eight grades." "Department teaching."

(e) Arrangement of parallel programs. "Spelling periods for different grades arranged for same time to permit transfer of brighter pupils." "Same for reading."

(f) Appointment of supervisors and supervising principal. "Position of supervising principal for primary grades created." "Appointed a director for a newly organized Bureau of Research." "Plan to hire a trained supervisor for writing next year."

(g) Inauguration of special schools. "An initial attempt to develop an elementary industrial school for pupils shown by the tests to be unfitted for the regular work."

3. Detailed Examples

(a) *Parallel Programs.* At the Lake Harriet School in Minneapolis a measurement by the Ayrès scale showed a wide distribution of spelling attainment among the pupils of each class. In the 8A grade, 43.3 percent of the children were of eighth-grade spelling ability. Grouped along with them were 26.7 percent of seventh-grade ability, 26.7 percent of sixth-grade ability and 3.3 percent of fourth-grade ability. More variable than this was the fifth-grade class, where the distribution showed every level of ability from the second to the eighth grade. On the basis of this showing, Miss Probst, the principal, observed that it was practically impossible in group instruction "to devise a spelling lesson which would tax the capacity of each individual in the group." It was determined, therefore, to rearrange the grouping in such manner as to give every child "capacity work." To justify this regrading, further tests were given. With the results of all the tests as a basis, the pupils were redistributed so that those of like ability recited together. In the new organization the original 7B class retained four pupils from an original total of thirty-two. The others were distributed to new groups as follows: seven to 8A, six to 8B, thirteen to 7A and four to the sixth grade. To the new 8B group, the several grades contributed in this fashion: 8A gave 7 pupils; 8B gave 14; 7A gave 4; 7B gave 6; the sixth grade gave 6; the fifth grade gave 5, and the fourth grade one—a total of 42.

When the redistribution of the pupils on the basis of ability had been made, the spelling recitations for all were arranged to take place between 11:45 and 12:00 o'clock on each day. At the sound of the bell, each pupil passed to the room where his particular level of work was in progress. There he would go each day until a definite change in his work occurred. If the average of his work for two consecutive weeks should fall below 90 percent, he automatically gravitated to the grade below. If he maintained a standard of 99 percent for four successive weeks, he was promoted to the grade above. To illustrate: two 8B boys whose beginning record showed about 65 percent dropped back to the fifth grade. Unable to maintain the pace of this grade, they dropped back to the fourth. "Here," to quote Miss Probst, "they evidently found their spell-

ing level, for they took a fresh start, were promoted to the fifth grade, then to the sixth and finally to the 7B group."

The chief outstanding result of the experiment was a very great diminution of the variability in the several grades. Whereas in the first test but 43.3 percent of the 8A pupils had eighth-grade spelling ability or better, 71.4 percent came up to this standard in the second test in May. In the 7A class, the corresponding figures were 45 and 80: in the sixth grade they were 55 and 90.

(b) *Special Classes in Schools.* A second change in school organization brought about by means of educational and mental tests is the institution of special classes for the education of exceptional children. Wallin reports (1914) eleven types of such classes.

(c) *Organization of Bureaus of Research.* Probably the most significant change in school organization growing out of the measurement movement is the organization of Bureaus of Research as a supplementary supervisory and administrative agency. Since this topic is treated at length in other chapters of this report an extended statement is unnecessary at this place.

III. COURSE OF STUDY

1. Changes Indicated by Replies to Questionnaire

It was difficult often to differentiate changes in the course of study from changes in methods of instruction. Under this head four types of change were more frequently noted than any others.

(a) *Change of Textbooks.* In some cases the textbook was merely changed for another book. In other cases, the book was apparently dropped altogether and other types of material substituted.

(b) *Emphasis* was changed by giving more space in the course to different parts of a subject. This seemed to be especially true in arithmetic and in spelling.

(c) Numerous replies indicated that the tests served to fix standards of achievement for different grades.

(d) *The organization of specialized curricula for special classes.*

2. Detailed Examples

(a) *Specific Aims to be Achieved.* The effect of educational measurements on the course of study has been to fix specific aims in the several school subjects. With most of the standard scales and tests there have been proposed ideal forms for the several grades, or the average and median scores made by these grades have been set as desirable ends to be achieved.

The specific aims to be accomplished may be grouped under three heads: aims in rate of work; aims in quality of work; and a combination of the two, under the head of efficiency.

The accompanying table contains a representative set of such aims. The full meaning of these standard scores will be understood only in connection with the tests themselves.

SAMPLES OF SPECIFIC AIMS

ACTIVITY	MEASURED BY	SCORE
Rate of Silent Reading	Gray (Ancient Ships)	2.87 words per second
Quality of Silent Reading	Thorndike Scale for Understanding of Sentences	7.50 on Scale Alpha 2
	Word Knowledge	8.50 approximately on Scale A, A2 or B
Addition	Courtis Series B	Rate 12 Accuracy 100 percent
Addition	Woody Series A	Accuracy 9.01 scale points
Reasoning	Stone	Rate 8.75 Accuracy 90 percent
Spelling	Ayres scale	100 to 50 percent on Columns N to Z
Writing	Ayres	Rate, 79 letters per second
		Quality, 62 Gettysburg scale
Language	Trabue	14 to 16 scale points
Composition	Harvard-Newton	70 on scale
Grammar	Buckingham	5.13 questions answered
Geography	Hahn-Lackey	0 to 99 percent on 20 sets of questions

Any pupil who at the middle of his eighth school year can achieve the above standards should be considered normal for the grade. A lower attainment clearly indicates the need of remedial work for the class or individual in question. A distinctly superior achievement is evidence of superior intelligence on the part of the pupils or of superior methods of instruction.

(b) *Minimal Essentials*. A second important movement making use of measuring methods is the effort to derive minimal essentials. Of the nine methods of determining the minimal content of the course of study described by Coffman, at least four are essentially methods of measuring the acquired behavior of children and adults; two are measurements of the content of reading matter, and the other three are concerned with pooled opinions. Of the ten chapters in the *Sixteenth Yearbook* of this Society, "Minimal Essentials in Elementary School Subjects," five make direct use of information derived from the measurement of children's attainments. The other five are based on measurements of the content of books and other published material.

It is unnecessary to enter here into a detailed statement of these investigations. It is sufficient to note that the determination of the content of the course of study must follow two fundamental principles suggested by the following questions: (1) What should children know and do as children and adults? (2) What can children at any age learn with profit? The final answer to both of these questions must be obtained by measurement.

IV. METHODS OF INSTRUCTION

1. Returns from Questionnaire

(a) *Increased Emphasis*. Approximately one-third of the replies note "increased emphasis," which apparently means more time given to a subject or more value placed upon efficiency in it. The following are representative of these replies:

"More emphasis, all grades, on meanings of words and sentences." "Stressing legibility in writing." "Greater emphasis on fundamentals in arithmetic." "More emphasis on correct use of words in reading, less on definition." "Special emphasis given to those subjects where standard was low." "More drill in all grades." "More silent reading."

(b) *Drill*. The favorite recourse for improving attainments which the tests show to be poor is "drill." This term is vague, often meaning merely more time devoted to repetition of certain processes.

"Arithmetic: All teachers required to give more drill work."
"Special emphasis given to those subjects where standard was low."
"Five-minute daily drill on fundamentals in arithmetic." "More time and attention given to drill in number combinations." "Dictation drills with attention on punctuation." "More intensive drill in grammar and punctuation." "More drill in spelling."

(c) *Specialized Drill*. Some correspondents report a particular type of drill, involving a definite change in the details of the drill process as well as change of time

"Courtis drill cards in arithmetic in two rooms; more oral drill in all." "Horace Mann method of spelling adopted." "Installed Palmer method of writing."

(d) *New Devices*. Another method of improvement of instruction was the invention of special devices.

"Made room charts showing individual's work (median, quartile, safety zone)." "Teachers used questions similar to Kelley test, and applied to geography and other subjects." "More instruction through interest of pupil." "Supervised study periods—all grades." "Three periods of supervised study added to school day: those who failed in one subject required to stay 1 period; in two, 2; etc." "Greater use of dictionary for meaning of words." "Tests devised to watch pupils' progress."

(e) *Individualized Teaching*. The measurements serve to fix attention on individual differences among children and to further the adaptation of instruction to individual needs. Illustrations:

"Individual attention; specifics devised for securing appreciation of good writing." "Individual help given slow pupils." "Methods adapted to ability of pupils." "Backward pupils discovered and given special attention." "Promotion more by subjects."

2. Detailed Examples

(a) *Methods of Drill in Arithmetic*. Mead, at the request of Superintendent Condon of the Cincinnati schools, undertook the experimental evaluation of two kinds of practice material in the fundamentals of arithmetic. The materials in question were the Courtis Standard Practice Tests and the Thompson Minimum Essentials in the four fundamentals. About 900 fifth-grade pupils

from fourteen schools were divided into two approximately equal groups and were drilled 15 minutes daily from February to May. The efficacy of the two kinds of practice material was determined by "preliminary and final standard tests with each group" (Courtis Series B). The initial and final tests, as well as the intervening practical exercises were given by the class teachers under standardized instructions, and care was taken to keep conditions constant and favorable.

The results of this carefully controlled experiment show that in *speed of work* the two kinds of practice material produce improvement, and essentially the same amount of improvement. Both also show gains in *accuracy of work*, but they differ essentially in the amount of improvement in accuracy resulting from the exercises. The pupils of the twelve classes using the Thompson Minimum Essentials show median gains in percent of accuracy for the four fundamentals of 2.5, 4.0, 2.9, and 15.7; similar figures for the Courtis Practice Tests were 9.7, 8.1, 8.9, and 18.2. Clearly, the Courtis Practice Tests are superior, and the test shows in what respect they are superior.

It does not follow from this that the Thompson Minimum Essentials are of no value or that in another grade and under other conditions they might not prove superior. What is fairly certain is that, upon the use of the two methods in fifth-grade classes under school conditions prevailing in Cincinnati schools from February to May, 1916, and described by Mead, the debate has closed.

(b) *Teaching of Handwriting.* The "two-squad" method has been used by Mr. A. G. Capps in measuring the effect of "diagnosis and corrective measures in the teaching of handwriting." The handwriting of 44 sixth-grade children was measured on October 9. All who scored high on the Thorndike scale, Quality 9 or more, and whose papers were relatively free from common errors, were put into an "advanced class." All others were put into a "special class." The advanced class was taught three days per week; the special class, five days per week. A pupil was allowed to pass from the "special" to the "advanced" class, when on the monthly tests he scored Quality 10 (Thorndike).

All pupils were treated by the same general method, which was as follows: The handwriting of each pupil was diagnosed following Freeman's analysis of "quality" into alignment, spacing, slant, quality of line, and letter form. On the basis of this diagnosis, remedial treatment was prescribed for each class and for each individual, and detailed methods of instruction were worked out. The pupils were made acquainted with their own difficulties and taught to practice with a view to achieving certain detailed aims, such as better form for the letter *a*, improved alignment, etc. The experiment was continued for five months, and standard tests were given at four-week intervals.

The significant results of the experiment may be stated as follows: (1) The advanced class improved in quality from 9.06, or less than fifth-grade attainment, to 10.47, or slightly more than seventh-grade scores (60 minutes per week). (2) The special class improved from 8.74, or fourth-grade score, to 9.68, or slightly less than sixth-grade average (100 minutes per week). In both classes there was a substantial gain in speed.

In the light of these results, regarded as tentative by the experimenter, there can be little doubt this teaching method has considerable claim to efficiency.

(c) *Improvement in Written Composition.* Somewhat different in type is the study by Brown and Haggerty of the improvements in English composition. The weekly composition exercises of three high-school classes through a period of twelve weeks were measured by the Harvard-Newton Scale. By this method it was possible to secure a "learning curve" for individuals as well as classes, and thus to see the educational behavior of a student somewhat more intimately than when only initial and final measurements are made.

From this experiment several facts stand out. (1) There is no essential difference in composition performance among classes rated as first-semester freshmen, second-semester freshmen, and first-semester sophomores. (2) In general, classes gain in power to write during a twelve-weeks period about four or five Harvard-Newton Scale points. (3) Some students, relatively poor ones, gain much more than the class average, in some cases as much as

twenty scale points. (4) Other students, often the superior individuals, make little or no improvement; some individuals do more poorly at the end of the twelve-weeks period than at the beginning. (5) Some composition topics elicit better products than others, as shown by the median scores of all classes.

This simple experiment does not get very far in solving the manifold perplexing problems of composition teaching. The method, however, offers a means of further investigation.

V. TIME DISTRIBUTION

The changes in time were mostly of the nature of increased time to subjects where the tests showed the product to be low grade. The following are characteristic replies:

"Lengthened periods for subjects where deficiency was greatest." "More time given to arithmetic." "More time given to writing in all grades." "Ten minutes of arithmetic recitation period used for drill three days per week." "Increased number of hours for industrial work."

Only one correspondent reported a diminution of time, saying, "We excused pupils and grades from work 'over done'." Numerous studies, from that of Dr. Rice on, have shown that results of school work are not directly correlated with the time spent on the subject. Studies in handwriting, spelling and arithmetic show that the maximal time may yield poorer returns than a smaller amount of time.²

VI. CHANGES IN SUPERVISION

As a rule, tests have been introduced into the schools through the supervisory and administrative officers. It is not surprising, therefore, to find that the results of the tests have had a direct and considerable effect on the detailed work of such persons.

The general supervisory practice is to report the results of tests to principals and teachers. Such a report gives not only the scores of the class or classes concerned but also comparable norms from other classes within the system and from other systems. Apparently some supervisors end their use of the tests with this report.

²Some concrete studies in this field were reviewed by the writer in *School and Society*, November 19, 1916.

A second step taken by other supervisors is a conference between the teacher and supervisor, a conference in which "the opinion of the supervisor is not pitted against that of the teacher, but in which the attention of both is directed to the definite and objective result of the test and to the causes producing such result." Growing out of such conferences come "new outlines of work," "re-organization of programs," "special lessons for teachers in teaching spelling," "requirements in the handwriting of teachers," in fact, any one of the changes hitherto enumerated.

A third step to be noted is a further examination of a class or pupil for the extension of the diagnosis. This is made with other tests and through personal investigation.

A fourth step taken by some supervisors and teachers is a second measurement, after a period of remedial work, to test the efficacy of the changed program. In about one-fifth of the cases where remedial work was reported, the supervisor had used the tests in this way. The following are typical replies:

In arithmetic "Graph showed greater improvement in grade in one month, than first graph showed from class to class (five months' work)." "Have used drill and are now *above* the Courtis Standard." "The weaker pupils do better work. More pupils brought up to required standard. Pupils more accurate." "Plateau disappeared which had existed from Grade VI to VIII; curve for both attempts and rights in all operations shows gradual development to Grade VIII."

In reading: "Improvement in median score from September 7 to January 23; Grade VII, 5.3, Grade VIII, 5.6."

In spelling: "Pupils average a grade higher." "More uniformity of grades and children know where they stand."

In writing: "Better quality. Both quality and speed nearer average for grade."

A fifth important use of tests by supervisors is to keep track of the normal progress of students and classes. Results of such tests serve as a sort of weather map of the school system and show the prevailing winds. They enable the supervisor to know in an intimate way the entire system and to direct his efforts at supervision where they are most needed. Where fair progress is being made he can give little attention and save his usually inadequate energy for the places where it is most needed.

Finally, it is apparent that supervisors are making the class attainment, as shown by the results of measurement, one factor in the rating of teachers and for the further professional training of teachers. The following replies show this:

"Introduced a system of teacher training." "Certain teachers required to go to summer-school." "Teachers required to visit classes with strong teachers." "In second semester, changed teacher whose class was weak to a lower grade class, to test power and presentation of subject." "Certain changes in both principals and teachers, and will require certain teachers to attend summer-school."

The experience of one supervisor is related in a most interesting paper on the Supervisor's Use of Standard Tests, by J. C. Morrison, who presents the details of a year's work in Chatham, Mass., and sums up the work in these words:

"Standard tests have proved an effective means in supervision. Through their use teachers are improving the technique of their method and exercising a nicer judgment in the relation of subject matter. Pupils are working to exceed their own record. Teachers and older pupils are coming to understand the scientific idea of education as it applies to the ordinary classroom. In no other way could the principal gain so close a knowledge of each individual child in the school. This knowledge is serviceable in placing new pupils, in determining promotions, in selecting accelerates and defectives, in searching out the special difficulties of the individual, and in gaining the cooperation of the parent. The results of the tests have proved of interest to the public. On the basis of these results the board of education has employed a teacher to give approximately one third of her time to the testing and supervision of work with special pupils. The school has made a start in the study of its children and will eliminate a large part of the wasted time and effort that results from the choice of the wrong high-school course."

In this survey of remedial measures based on the use of standard tests one observes that many of the changes made are the time-honored ones which school officers have traditionally made on the basis of personal opinion and in response to changing ideas. Apparently what the tests do in such cases, is to render definite the arguments for these changes and to make accurate the evaluation of the efficiency of remedial measures when once they have been car-

ried out. To a schoolman who cares to guide his practice by facts rather than by debate, this service sufficiently justifies the idea of measurement. To argue the case with other types of individuals is, perhaps, a waste of time.

One thing the tests show, however, which traditional practice has never recognized, because it never knew it, and that is, the enormous range of individual differences among children, both in ability and in attainment. These differences the tests reveal in a way that must inevitably alter profoundly our whole program of education.

CHAPTER IV

GENERAL ORGANIZATION OF EDUCATIONAL MEASUREMENT WORK IN CITY SCHOOL SYSTEMS

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Every change which takes place in educational practice is preceded by a period of agitation. The profession must be made aware that a given condition is unsatisfactory and must be convinced that the proposed change will bring about improvement. In addition, the lay public must be educated to understand the meaning and significance of the proposed change. Many educational schemes never proceed beyond this stage of professional and public agitation.

Following the period of agitation comes a period of trial and experimentation, in which the proposed change is subjected to close scrutiny. Generally, both the profession and the public produce searching and frequently unjust critics. These criticisms usually prevent even a trial of any changes in our educational practice which do not give promise of a reasonable degree of success.

In those cities where special research departments have been organized, educational measurement is established beyond the stage of argument or debate. There the movement has passed successfully through the periods of agitation and of experimentation. Even through the country generally, the movement has received such general recognition and endorsement during the past few years that progressive school systems do not now need to be provided with arguments in favor of educational measurement. This chapter, therefore, is not an argument for the introduction of educational measurement: it is not a discussion of the debatable phases of the subject; neither is it a delineation of the educational advantages to be secured by measurement. Rather, it is a description of ways

and means of introducing systematic educational measurement in a city school system and carrying it on successfully. The methods suggested are those which appear to have succeeded best in those city school systems that have undertaken to measure educational results in an organized way.

The time for the introduction of educational measurement into a school system should be wisely chosen; standard tests should be given only after the way for them has been carefully prepared. The success of any educational reform depends on the intelligent co-operation of the members of the educational profession. This is especially true of educational measurement, because it involves an entirely new method of attacking educational problems and an altered attitude on the part of teachers toward the whole educative process. Success is contingent on a thorough understanding of the aims, methods, possibilities, limitations, and achieved results of the use of standard tests and scales. Unless and until the profession is so informed, and as a result is prepared to cooperate effectively in its administration, the possible values of educational measurement are not likely to be secured. Proper instruction through lectures, talks, and teachers' meetings will do much toward preparing the way for success in carrying on such work.

Educational measurement involves selection of the tests to be used, testing the children, marking or scoring the papers, tabulating and interpreting the results, and utilizing the conclusions as a basis for securing improvements in teaching when the outcome proves that the present teaching is unsatisfactory. This chapter deals with each of these topics.

A. SELECTING THE TESTS

The attitude of teachers and others towards educational measurement depends largely on first impressions. The importance of making favorable first impressions, therefore, cannot be over-emphasized. The first standard test selected to be given in a school system should be one which is most likely to be favorably received by teachers. Fairly satisfactory tests for several subjects or phases of subjects are now to be had.²

²See Chapter VII for a list of available standard tests and scales.

Adequate standard tests for any school system should possess the following characteristics: they should measure educational products obviously within the scope of the course of study of the city; they should aim to measure those subjects or phases of subjects which are clearly measurable; they should be reasonably simple; they should be accompanied by adequate instructions as to how they are to be given and how the results are to be scored; they should be scored and tabulated with reasonable ease; they should already have been given to a sufficient number of children so that well-founded standards of achievement have been established.

The demand for standard tests in various subjects has been so great that some questionable tests have been put on the market. For example: a so-called 'standard test in spelling' is available which tests the ability of children in Grades V to VIII to spell such words as the following: *nunciaturc*, *sphericity*, *hoggery*, *senescent*, *symmetrize*, *incremental*, *rigmarole*, *verisimilitude*, *anthropometric*, *tubule*, *erosible*, and *divestiture*. These words are not to be found in the course of study in most school systems in the United States. Lack of ability to spell such words cannot be charged against the schools, because the schools have not undertaken to teach children to spell them. This test and others like it that do not measure classroom instruction, should be avoided—at least in the beginning of testing work. If they are used, the purpose in giving them and their limitations should be distinctly understood. There are satisfactory standard tests in spelling which are obviously within the scope of classroom instruction.

Criticism has been urged against educational measurement on the general ground that important products of good teaching in certain phases of all subjects and in all phases of certain subjects cannot be quantitatively measured. Whether this is so or not may be debatable: let the debate go on. It is not necessary, however, to postpone all educational measurement until the debate is settled. In the meantime, giving standard tests in measurable subjects or in measurable phases of subjects will be profitable for teachers and pupils, and may also furnish valuable information by which to determine to what extent the results of educational practice generally are measurable.

In introducing educational measurement into a school system for the first time, the more simple the tests are, the better. To be usable, standard tests must be accompanied by adequate instructions for giving them and for marking the papers. Unfortunately there is no royal road to travel in carrying on educational measurement. The details of giving the tests must be mastered by those who would make proper use of them. If tests are worth giving at all, they should be given according to the systematic plan which the author of the tests has worked out. Success in introducing testing into a school system will be more certain if the tests are selected only after careful consideration of the instructions for giving and scoring them.

It is also important that well-recognized tests be used in the initial testing in a school system. Not everyone who desires to give standard tests has the time, resources, or qualifications for preparing his own tests. It cannot be too urgently recommended that at first tests should be selected from those already available. Later, one may successfully experiment with the preparation of the tests. Among the gravest dangers which educational measurement faces today is that which arises from amateurish attempts at the construction of standard tests by those who do not realize the need for a careful testing of the tests themselves before they are published for general use.

Well-recognized tests are urged for use; first, because such tests are undoubtedly superior to those which would be prepared under most circumstances by a beginner; second, and more particularly, because the results achieved in any school system can thereby be compared with similar results from other school systems.

One of the desirable outcomes of the giving of standard tests is the establishment of standards of achievement. Such standards furnish measures with which one may compare his own results. Standards are adequate, however, only when they are based on a large number of results. Tests which have been standardized from the results achieved by a small group of pupils in one or two school systems are to be avoided unless there are other quite special reasons for using them.

Testing should always be purposeful. Testing children merely for the sake of giving tests cannot be too thoroughly condemned. The following principle of practice is commended: never give a standard test unless you have a definite purpose related to the improvement of instruction and unless you are prepared to tabulate, interpret, and *use* the results at once.

Since the ultimate purpose of all educational measurement is the improvement of the instruction, it also becomes of paramount importance that the results be made known to the teachers and others before their interest in the tests has waned.

B. GETTING TESTS GIVEN

Let us repeat that if the results obtained from giving standard tests are to be worth the time, money, and effort expended, the tests must be properly given. This means not only that they must be given in the same manner in every classroom throughout a school system, but it means, also, that they must be given according to the directions that accompany the tests. If this is not done, the results cannot be compared with the standardized achievements in other cities—a fact which renders the interpretation of the results very difficult, if not impossible.

It may be assumed that the author of the tests had reasons for adopting the procedure indicated by his instructions, and that the most effective use cannot be made of the results obtained in any school system unless those directions are followed. Even though one does not agree with the directions for conducting the tests, one would better not use the tests at all than to deviate in any important respect from the author's directions for giving them.

Tests may be given either by principals, supervisors, or teachers, or by persons especially trained for the purpose. Such tests as spelling tests, which are among the simplest to give, may be given satisfactorily by principals or teachers. They do not require careful timing, and the directions for giving are comparatively simple and are easily followed. With a minimum of instruction any principal or teacher can successfully conduct spelling tests.

Such tests as the Courtis standard tests in arithmetic offer a more difficult problem. They must be accurately timed and the

conditions under which they are given must be controlled. Those who give such tests must be specifically trained for the purpose.

For this purpose one of two methods may be followed: a group of teachers or principals in the service may be instructed, outside of school hours, and assigned to give these tests in the various classes throughout a city. Or, as in Boston and other cities, those preparing to become teachers may be trained to give these tests as a part of their preparation for teaching. In Boston each member of the senior class in the Normal School spends one month in the Department of Educational Investigation and Measurement and receives instruction in the meaning of educational measurement and the training necessary for giving such tests as the department desires to have given. Following this training, these seniors are assigned to give the tests in the various schools of the city.² Very similar arrangements are made in many other places. Cities in which a college or university is located have also used trained college students of education as special examiners.

Experience has not yet determined which practice is likely to be followed in the future. It is certain that whoever gives tests must receive proper instruction in the methods of giving them. The policy of training normal-school seniors in measurement work is based on the assumption that the teaching staff of a city ought to be competent to give such tests as are needed for the measurement of the work of a school system. If the teachers of a city can be so trained, this is undoubtedly the cheapest and most effective method of solving the problem. If, for one reason or another, teachers do not prove satisfactory as examiners, then it necessarily follows that competent specialists must be employed for giving the tests, as well as for carrying on other phases of educational measurement. Whatever be the method finally adopted, those who give tests must not only be properly instructed, but their work must also be adequately supervised. This supervision is the function of a department of educational research. In the absence of such a department in a school system, the superintendent's office should assume this responsibility.

One of the difficulties in relying on the teaching staff as a whole to give standard tests grows out of the attitude of teachers

²See article by the writer in *School and Society*, Vol. V. pp. 61-70.

toward such tests. In their attitude toward educational measurement one may expect to find three distinct classes of teachers in every school system: (1) those who endorse it, (2) those who are indifferent to it, (3) those who oppose it. On this account it is probably wise to introduce standard tests into a school system on a voluntary basis; that is, to give the tests only in those schools or classes where principals and teachers are willing to have them given.

The success of educational measurement in a school system depends on doing a small amount of testing and *doing it well*, rather than on doing a large amount. Quality rather than quantity is more likely to win favor. Opposition to educational measurement can best be disarmed by showing the improvement secured from the results of standard tests.

C. SCORING THE PAPERS

The amount of time involved in giving tests is small compared with the time necessary for correcting the papers. Assuming that the teachers give the tests, who shall mark them? The answer to this question depends largely on the character of the tests. Certain types of papers from some tests can be satisfactorily marked by the pupils under the supervision of the teacher. For example: if a spelling test is given by the teacher, she may at once spell the words aloud and have the children mark the errors, following the common practice. The pupils' scoring in every case, however, should be properly checked by the teacher. Likewise, in some tests in arithmetic, children may be provided with answer cards and shown how to correct the papers.

The scoring of many tests, however, involves the exercise of some judgment, and pupils cannot be depended on to score such tests. In most cases, papers in geography and history should not be scored by pupils. Further, if one desires to give credit for a correct method in problem work in arithmetic, even though the answer is incorrect, the judgment of the teacher is undoubtedly necessary.

Teachers should not be burdened with an unreasonable amount of work in the giving of standard tests. A satisfactory principle to follow may be stated as follows: teachers should be expected to correct test papers and tabulate results only in so far as this work

will increase the teacher's knowledge of the abilities of pupils in her class. Putting this principle into practice would mean that in most cases the teacher may be expected to mark the individual papers of pupils in her class. She may be expected, also, to make class tabulations or summaries of individual achievements, because only by so doing can the teacher learn where her class stands in relation to other classes in the school, or in relation to the general standard of achievement established for the test. Beyond class summaries the work is likely to be too largely clerical to be of direct value to the teacher, and should be carried on by others.

In marking papers and making class tabulations, teachers should have some one to whom to look for instruction and guidance. If there is no regularly organized department to supervise and direct educational measurement, some qualified person in the system should be assigned to do it. Through teachers' meetings held after school, for which classes may be dismissed a half hour or an hour early and through instructions issued from time to time, the supervisor of educational measurement can materially lighten the burden which otherwise falls on teachers in this type of work.

D. TABULATION AND INTERPRETING THE RESULTS

In Boston the Department of Educational Measurement has found an effective and economical way of making grade summaries, school summaries, and city-wide summaries of testing results. Girls from the Boston Clerical School are assigned to this work. These girls are being trained specifically for clerical work and on graduation from school may take positions which require skill in just the kind of work involved in making tabulations from tests. The Department asks the Clerical School to send relays of eight or ten girls as long as the work lasts. Each group of girls reports for three or four days to the office of the Department where the tabulating is to be done. The Department instructs them in the special methods of tabulation, and has the work so systematized that a definite record is kept of the speed, accuracy and effectiveness of the work of each girl. Their attendance is also kept and reports are made to the head master of the school when the girls return. The teachers in the Clerical School consider this work an important part of the practice and

training which the school desires to give. The Department has found it a satisfactory method of getting the work done. The expense to the city involves only the car-fare of the students to and from their homes to the office of the Department. Much the same method has been followed in other cities that have commercial departments in their high schools. It affords a practical solution of what is often a critical problem in measurement work.

If teachers or prospective teachers are trained to give the tests, and to score the papers of their respective classes, and if commercial-high-school pupils or normal-school pupils are used to make grade summaries, school summaries, and city-wide summaries, little or no direct expense is involved in that part of the work. But even though members of the teaching staff or pupils in the school system are thus employed, many additional tabulations will be desirable and necessary if the results are to serve their greatest usefulness. For such work it is essential that competent clerical help be provided. It is the kind of work which is not easily done by those unfamiliar with it, and is likely to be tedious as well as voluminous. To be done effectively it should be done by those who understand it and who have more than ordinary interest in it. Such persons can be found in every school system and when found, should be assigned to render this kind of service. No city should undertake educational measurement without understanding that it involves some expenditure: a portion of this should be devoted to the securing of competent clerical assistance for statistical tabulations and another portion to the general direction and supervision of the work (by the superintendent of schools in the smaller cities and by a special school official in the larger cities).

After the various tabulations and summaries have been made by grades, by schools, and for the city as a whole, the results must be interpreted. This is one of the most important phases of educational measurement. On the interpretation of the results really depends the usefulness of the tests. One of the greatest dangers involved in educational measurement throughout the country today is the fact that many persons are giving tests who are not competent to tabulate and interpret the results. In general, interpretation should be made by the superintendent, or by some other school

official thoroughly conversant with all the local conditions. The best results will be obtained when some competent person, who is especially interested in and trained for such work, is engaged by the board of education to supervise the giving of tests and to interpret the results to the teaching staff.

E. MAKING USE OF THE RESULTS

Successful educational measurement work in a school system involves not only selecting the best available tests, giving them according to directions, scoring the papers, tabulating the results, (all at a minimum of cost in time, energy, and money) and interpreting the results, but it also involves getting the information derived from the tests to the persons concerned, getting those persons to consider it, and getting them to do something about the conditions revealed, if those conditions demand it.

Obviously, some sort of report must be prepared by the official who interprets the results of the tests. Typewritten or mimeographed copies of the report may be made for a small school system, but if a large number of copies is needed, the report should be printed. If printed, it is more likely to be given consideration by those concerned and to be kept for future reference and guidance.

Much of the success in getting the desired information to those concerned will depend on the character of the report. With conditions as they are at present, the facts must as far as possible be stated in simple, non-technical language. Few teachers now in the service have any knowledge of the technical terms employed in educational statistics. If such terms are used, they must be carefully defined. Our courses for the training of teachers are now beginning to include some study of educational measurement. It will be a generation, however, before the teaching profession as a whole can be presumed to have had training in educational statistics. Until that time it will be necessary to prepare non-technical reports for the teaching profession.

Finally, it should be emphasized that standard tests are for diagnostic purposes: they show the abilities and needs of children. Recently one teacher said: "My class has taken the Courtis tests in arithmetic twice each year for three years, and I do not see that it has done them any good!" On investigation, it was found that this teacher had made no effort whatsoever to use the information furn-

ished by the tests as a basis for correcting the many weaknesses shown among her pupils. There is no special magic in standard tests which will work any educational miracles on pupils who take them. The teacher must be made to realize that the results from the tests are for her information. Unless she is shown how to make use of them, and is willing to do so, standard testing *is not worth while*. On the other hand, if the teacher is willing and intelligent, the information derived from standard tests is of the greatest service. For it enables her to reach desired goals by the most direct path, with the least expenditure of energy and labor on her part and with the greatest benefit to the children.

CHAPTER V

BUREAUS OF RESEARCH IN CITY SCHOOL SYSTEMS

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The city bureau of educational research is the direct and logical outcome of the combination of the survey movement and the movement for the use of measurement. A careful appraisal by a group of experts from without has been demanded and paid for by community after community. Very evidently such stock-taking is regarded by the public as beneficial in its effects. Too often, however, the result, as far as the local schoolmen are concerned, has been disastrous. The time spent by the experts in the local field is necessarily short, their knowledge of local conditions necessarily limited and their interpretation of results has sometimes seemed to local school officials unwarranted and unjust. More often than not, superintendents have attempted to explain away the defects revealed and to make light both of the facts and of the recommendations of the survey experts. But facts are stubborn things, and changes of superintendents and upheavals and reorganizations of various sorts have inevitably followed the adoption of such a policy. So it has come about that many times a survey report has been of more direct benefit to schoolmen in other cities than to those in the city for which it was made.

Thoughtful superintendents have come to see that, above everything else, the best insurance against the survey lightning is a survey conducted from within. Many a schoolman has asked himself the searching questions: "What would a survey reveal about my school system? On a factual basis, what do I really know about my own work?" Straightway he has begun himself to investigate. The various types of studies made in a modern survey are repeated on a smaller scale. Measurements are made and constructive attempts at remedial adjustments are begun.

The average administrator, however, is a busy man. He has little time, and by virtue of his training and position, little aptitude for close analytical studies or statistical investigation. Ordinarily he himself does just enough to realize the importance and value of the work, then delegates it to a specially trained person who works under his direction. In the smaller towns and cities this person may be only a clerk or bookkeeper who performs the mathematical and statistical labors involved. In the medium-sized cities a supervisor or assistant superintendent is often detailed to give part or all of his time to the work, and in the larger cities there are formal organizations of special research departments.

One of the best formulations of the functions of such research work is to be found in the report of the Committee on School Inquiry, New York City. Professor E. C. Elliott in his study of the administration of the New York Schools¹ made among others the following recommendation:

“Recommendation III

“That there be established as an integral part of the system of school control, a Bureau or Division of Investigation and Appraisal.

“This bureau or division should be in charge of a chief or superintendent, who is directly responsible to the Board of Education, and should be organized in such a manner as to enable it to serve as the central agency for the gathering and interpretation of statistical and other data with reference to the schools; and also for the carrying on of such investigations as are necessary for the rational development and expansion of the school system. It should bear the same general relation to the Department of Education as the existing Bureau of Municipal Investigation and Statistics bears to the Department of Finance.

“The following arguments may be indicated:

“(1) The school system of the city suffers from a lack of definite, detailed knowledge of its own working and its own cost. As has already been pointed out, the fundamental importance of the inspectorial form of control has been recognized only to a very limited extent. And even where its importance is recognized, officials charged with the responsibility for administrative or supervisory duty appraise their own performances. Investigation that is needed is not carried on at all.

¹*Report on Educational Aspects of Public School System of the City of New York to the Committee on School Inquiry of the Board of Estimate and Apportionment*, Volume II, page 401.

“(2) It is evident that one of two things will result in the immediate future. Either the work indicated for this proposed bureau will be attempted by agencies outside of the school system or else there must be established, within the school system, as an integral part of its organized control, an agency properly equipped with trained investigators to set forth to the supervisory and administrative officials of the school system, and the people of the city, those essential facts absolutely necessary for the intelligent development of schools and of public sentiment. Of these alternatives, it would seem that the latter is to be greatly preferred. No outside agency could carry forward the work of inspection and of formulating impartial judgments of results, and of proposing new procedures without much friction and loss of energy.

“(3) The problems of public education in New York City are not conventional problems. Many of the more pressing ones are new in the social and educational world. They cannot be solved by preconceptions, or the showing of hands. In so far as possible, the situation and causes that have generated these problems must be weighed and analyzed before rational and permanent solutions can be found.”

This recommendation was immediately acted upon. A Division of Reference and Research was formally organized and began its work at the opening of schools, September, 1913. The quotation above, therefore, is of historical interest. For while the New York Bureau by no means represents the beginning of systematic, scientific study of school problems by school authorities, it was undoubtedly the first to be definitely organized for that sole purpose.

The real beginning of the movement that has led to the establishment of bureaus of research cannot be clearly traced. In some cities there have been for many years committees, bureaus and special commissions for the more or less systematic study of buildings, of children, of teachers, of instruction, and of many other forms of school activities. As rapidly as the movement for measurement has developed, the investigations of these agencies have become more and more truly scientific. Even today the organization and function of a bureau of research are not clearly defined, and all sorts of studies are being carried on by all types of workers. In some cities, the department consists of little more than a high-sounding title bestowed as a compliment upon some existing school officer. In others, the director of the bureau is given the rank and salary of an assistant superintendent and is a real director of an extensive de-

partment. Between these two extremes every type of variation may be found.

It is not surprising, therefore, that the actual work of a bureau of research varies from city to city, being determined in the main by the tastes and training of the director, and somewhat by local needs. In some cities attention has been given almost wholly to a study of costs and to purely administrative problems; in other cities the energy of the department has been expended only on the measurement of educational products; in still others the deliberate attempt has been made to do some work in every field. In general, the tendency seems to be to regard the special function of the department as the devising, giving, scoring, tabulating and interpreting of standard tests and the prosecution of such other investigations only as may aid in the interpretation of the results secured.

A city department of research ordinarily consists of a director and clerical or stenographic assistants. At first, the tendency was to select any capable schoolman available, with little regard for his qualifications for the special work, but later appointees, either as directors or assistants, have been young men or women specially trained in statistical methods and in educational measurements. The director, almost without exception, is responsible directly to the superintendent and under his immediate control. The salaries paid range from \$1,100 to \$6,000, (median of 13 cases \$2,700).

It has proved very difficult to obtain complete information with regard to the number of cities which have organized bureaus or which are carrying on organized work in measurement.² In spite of repeated questionnaires and persistent efforts, only a most tentative list can be given. However, formal organizations are found in the cities listed on the following page.

No attempt has been made to list cities in which research work is being carried on without formal organization, because of the impossibility, both of making the list at all complete and of distinguishing between a mere incidental use of tests once from idle curiosity and their persistent, intelligent use, year after year, for worthy ends. Seattle, for instance, does all the work and has all the benefit of a bureau of research, but has no formal organization. The assistant

²The various functions of a bureau of research are illustrated in other chapters, and the discussions will not be repeated here.

PARTIAL LIST OF CITY BUREAUS OF RESEARCH

City	Title of Bureau	When Organized	Name of Director
1. Baltimore, Md.	Bureau of Statistics and Research		Edwin Hebden
2. Boston, Mass.	Department of Educational Investigation and Measurement	1914	Frank W Ballou
3. Buffalo, N. Y.	Bureau of Research	1916	Wm. A. Mackey
4. Chicago, Ill.	Department of Standards and Statistics	1917	S. B. Allison
5. Cleveland, Ohio	Department of Reference and Research	1916	C. W. Sutton
6. Detroit, Michigan	Department of Educational Research	1914	S. A. Courtis
7. Hibbing, Minn.	Department of Educational Research	1915	J. W. Richardson
8. Kansas City, Mo.	Bureau of Research and Efficiency	1914	Geo. Melcher
9. Louisville, Ky.	Psychological Laboratory	1914	Henrietta V. Race
10. Los Angeles, Cal.	Division of Research	1917	Robert Lane
11. New York City	Bureau of Research and Reference	1913	E. A. Nifenecker
12. New Orleans, La.	Bureau of Educational Research	1912	(Discontinued)
13. Oakland, Cal.	Bureau of Reference and Research	1914	Virgil E. Dickson
14. Omaha, Neb.	Bureau Educational Research	1917	H. W. Anderson
15. Rochester, N. Y.	Efficiency Bureau	1912	J. P. O'Hern
16. St. Paul, Minn.	Bureau Research and Efficiency	1917	L. L. Everly
17. Schnectady, N. Y.	.....	1913	H. L. Davenport
18. Topeka, Ks.	Bureau Research and Efficiency	1916	Ira J. Bright

superintendent in charge is a director of educational research in all but name. There are a large number of such cities throughout the United States. At the other extreme is the superintendent or teacher whose curiosity is stimulated by some talk or article, and who gives a test once to a single class. The sales of standard tests have grown to very great proportions. Last year, of a single popular test, nearly 900,000 were used, and the annual sale of a few other tests run well over 100,000 copies each. Nor is the use of tests confined to this country. Shipments are made to all quarters of the world. It seems quite probable, therefore, that the number of bureaus of research are destined to be greatly increased in the immediate future.

CHAPTER VI

COOPERATIVE WORK FROM A UNIVERSITY CENTER

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One of the most significant developments in the university in the last twenty years has been the growth of the idea of service—service not only to the comparatively few who were able to come to the campus, but service to the many who were not able to come. The idea was developed largely in state universities, where the funds for support came from direct taxation of all the people of the state and where the leaders came to realize that the service of the university should be extended to all who were taxed to support it. Only recently, however, has the university as a whole made an organized effort to educate all the people in its territory and to render service in the solution of the problems of its supporters off the campus. In fact, some of our state universities are doing almost nothing in these lines at the present time.

One of the very latest lines of service to be developed is that of cooperative educational research. The movement is so completely in its infancy that the method and the organization of the work have been but imperfectly worked out. However, two aims are rather definitely agreed upon by those engaged in this work, namely: (1) to make the university bureau a center for the direction of cooperative work with the school people of the state in the solution of the problems in which the latter are most interested; (2) to make the bureau an agency for the collection of rough data; for the tabulation, organization, and interpretation of these data; and for the distribution of the results of the study to the people contributing and to others, in order that significant facts may be known by the workers in the field.

A third aim might be added (though it must necessarily be subservient to the other two)—that of gathering masses of scientific

data which may be used in the further study of educational problems.

Nearly all problems connected with public-school work will lend themselves to cooperative research when once the university and the school people in the state come to a close understanding. The early efforts in the collection of data on school attendance, age-grade and age-progress studies, school health and causes of absence, the use of standard tests in arithmetic, reading, spelling, etc.; the figuring of unit costs of instruction and scoring of buildings and physical equipment—together represent but a small portion of the field that may be entered with profit.

The length of the period of compulsory schooling is increasing, but it does not suffice merely to attend longer. Much needs to be known concerning the extent to which communities and states are fulfilling their obligation to *all* their children—the obligation of giving them seven to twelve years of educational opportunity of a kind which will function in self-support and a wholesome social attitude. We need to know not only the extent to which this opportunity is offered, but also the extent to which this opportunity is being utilized. Cooperative research from a university center could obtain this knowledge.

We are in a time of critical questioning concerning the materials of education and the quality of the product turned out by our schools. The whole field of the school curriculum is open for research. Experimental methods certainly ought to be used in determining such things as time allotment, material to be used in each of the various grades and the arrangement of this material throughout the course. It is possible that method of presentation might also be included. This experimentation could be advantageously directed in cooperating schools by the university research bureau. Each problem would be specifically stated and the technique of procedure worked out at the university. The bureau would have the constructive criticism of the faculty in education and the preliminary experimentation would be carried on in the university experimental school. This would prepare the way for most effective work in the public schools which were cooperating with the bureau. As results were secured, each advanced step would thus be-

come immediately available to all the schools of the state. Many city superintendents are experimenting along some of these lines, but their experiments are not coordinated. Cities having bureaus of research are doing more extensive and critical work. But under the leadership of the university it would be possible to conduct such experiments under the varied conditions of small and large city, with the typical schoolroom conditions of each, and thus render a service to all communities in the state.

It is not the purpose of this chapter to list all the problems of cooperative research nor to give in detail the manner of solution. The purpose is rather to state the aims of a research bureau in a university center and to note very briefly some of the larger fields that await attack.

DEVELOPMENT OF THE IOWA BUREAU OF EDUCATIONAL SERVICE

Method—The fundamental aims noted above have been kept constantly in mind in the development of the Bureau of Educational Service in the Extension Division of the University of Iowa. The work was started in the fall of 1914, and the writer has been in charge of the work since its beginning. Some time was spent in traveling over the state and talking with the superintendents and thus learning at first-hand the most promising lines for initial endeavor.

The field had been partially prepared by courses in tests and measurement given in the College of Education during the preceding two years. Schoolmen attending the University had gained some knowledge of school surveys and some interest in cooperative work. The hearty cooperation of the faculty in education has been one of the greatest assets of the Bureau. In classroom, in institutes, and at teachers' associations they have furthered the work through frequent reference to the Bureau and its activities. The director of the Bureau holds rank in the College of Education and is a member of the instructional staff during the summer session. He thus comes in contact with the superintendents and principals who take summer work and assists in training them for further work in the field.

The annual conference on supervision, held at the University under the joint auspices of the Extension Division and the College of Education, has contributed much to the development of the work. It has brought together a group of school people (increasing in number from year to year) who are primarily interested in the problems of supervision. Such men as Judd, Strayer, Coffman, Ayres, Bagley and others have appeared upon the programs and promoted the interest in scientific education. The director of the Bureau has had a place at one general session each year and presented the results of research studies. At this conference, at the State Teachers' Association and at the sectional educational meetings each year, the director has met superintendents, principals and teachers in general sessions and round-table discussions. He has also met another group of men and women, the county superintendents. These persons, almost the only supervisors of the rural teachers, are becoming more and more interested in measurement of results, and their cooperation is being secured.

In a word, the secret of the development of the Iowa Bureau has been in the establishment of cordial cooperative relations with the various educational agencies of the state.

Fields—The first research problem attacked was that of attendance and the second, the measurement of school progress through the use of standard tests. In February, 1915, an arrangement was made with Mr. S. A. Courtis whereby the Bureau has exclusive control of his Series B tests in the state. In November of the same year a similar arrangement was made for the handling of the Kansas Silent Reading tests. These arrangements are still in force. Meanwhile, the Bureau has kept a small quantity of other tests on hand and stood ready to secure any others upon request. In addition to furnishing the superintendents of the state with the test material at cost, the Bureau has stood ready to give personal service in the giving of these tests. The writer has gone into a number of schools and demonstrated to the superintendents and principals the method of giving, scoring, and interpreting the results of these tests. This has resulted in the schoolmen becoming very much interested in the new field of tests and measurement. Many of these men and women have since studied at the University to increase their knowledge along these lines.

A third activity developed has been an information service by which the Bureau attempts to give, through its contact with the various departments of the University, technical information on any problem connected with the schools of the state. Questions on buildings, heating, lighting, ventilation, playgrounds, health service, course of study, census, finance, etc., have come from school boards, superintendents, teachers and patrons, and the Bureau has transmitted to the inquirers the best information available.

Another feature of the work of the Bureau has been local school surveys. On joint invitation of the school board and superintendents, a survey of any phase of a local school problem will be carefully made, the results analyzed and recommendations rendered. Care is taken here not to encroach upon the field of legitimate private enterprise. For example, service that belongs definitely to the field of an engineer, architect, or public accountant is not given.

PRESENT STATUS OF WORK

As a result of the activity of the Bureau during the three and a half years of its existence, its status has been quite firmly established. At first there was a question in the minds of many, both in and out of the university, whether such a bureau was a legitimate part of the activity of a university and perhaps even more of an Extension Division. At present the doubt no longer exists in Iowa. The Bureau, through its service to the superintendents and school boards, has settled this question affirmatively.

It is understood at the University that it is the function of the Bureau of Educational Service to conduct researches in the field of education looking toward the promotion of efficiency in school work. All reasonable assistance will be given by various departments and colleges of the University to the furtherance of this work. This cooperation has been secured through a sincere effort to ask only reasonable assistance and to give full credit to the college, department or individual which rendered assistance to the Bureau.

The relation of the school people of the state to the Bureau has always been that of voluntary cooperation. No system of university credit for work done or other means of stimulating their cooperation has been offered. At all times there has been a definite under-

standing between the director of the Bureau and the superintendents that each superintendent should decide for himself whether he ought to cooperate in any proposed research. If he believed that the result of the research would be sufficiently valuable to his own school to justify the expenditure of the time and effort required, the Bureau would be very glad to receive his contribution. If he did not believe this would be the case, the most friendly relationship was maintained, and the invitation was repeated when another line of research work was undertaken. Thus, each superintendent in the state has come to look upon the Bureau as asking for only such assistance as shall contribute directly to the solution of his own problems.

RESULTS ACCOMPLISHED

The results accomplished fall rather definitely into three groups, according as they pertain to (1) state-wide surveys, (2) local surveys, and (3) general service.

State-wide Surveys—

(1) A state-wide survey of handwriting involving 110 cities and towns and rural pupils from fourteen counties was made in 1915 and the results issued in bulletin form.¹ The following six questions were asked and answered on the basis of the information secured by the survey:

1. How well do Iowa school children write?
2. Do children improve their quality of writing regularly as they progress through the grades?
3. Do children attending school in towns and cities write better than those attending the rural schools?
4. Do the children in the larger cities write better than those in towns or smaller cities?
5. How do children in this state compare with children in other states?
6. Is the quality of writing of the average eighth-grade child sufficient to satisfy the ordinary demands of every-day life outside of school?

The samples of writing were scored by the Ayres Handwriting Scale² and the conclusions were as follows:

¹E. J. Ashbaugh, *Handwriting of Iowa School Children, Extension Bulletin, No. 15, State University of Iowa.*

²Leonard P. Ayres, *A Measuring Scale for Handwriting*, Russell Sage Foundation.

1. Iowa school children in the eight grades write approximately at Qualities 30, 35, 40, 45, 50, 52, 57, and 60, respectively, on this scale. Reference to the scale is necessary to understand the means of these values.

2. Yes. The improvement is quite uniform through the lower grades, but less rapid in the upper.

3 and 4. No. The differences between the quality of writing of children attending the rural school, small town and cities are negligible.

5. On the average, Iowa children are writing as well as children of like grade elsewhere in the United States.

6. Apparently the quality of writing of the majority of eighth-grade children will satisfy the ordinary demands of daily life, since 75 percent of these children write a better quality than is required by the New York Municipal Civil Service Commission.

(2) A similar survey of achievement in the fundamentals of arithmetic as measured by the Courtis Series B tests was made in 1916 and the results distributed in a bulletin.³ The following four questions were proposed and answered in this bulletin:

1. How skillful are Iowa children in performing the four fundamental operations in arithmetic?

2. How does the skill of Iowa school children compare with that of children of like grades in other states?

3. How does the skill of children in small towns compare with that of children in larger towns and cities?

4. What use can be made of Standard Tests?

1. The median speed and accuracy of children were ascertained in each of the grades. Mr. Courtis' standard as well as the scores of each of the cities contributing data was furnished for purposes of comparison. The evidence indicated that more speed was needed in the upper grades and greater accuracy in all.

2. Iowa school children were shown to excel in most grades and operations when their scores were compared with the available records of sister states.

3. While, in general, the scores of pupils in smaller towns are lower than those of pupils in larger places, the records of some small towns showed clearly that size of place is not a determining factor.

On the basis of these showings many schools in the state have modified their courses in order to give greater attention to drill work in fundamentals.

³E. J. Ashbaugh, *Arithmetical Skill of Iowa School Children*, *Extension Bulletin, No 24, State University of Iowa*.

(3) Less elaborate studies have been made of achievement in reading and spelling, attendance, causes of absence and teachers' marks. In reading and spelling, the general state situation seems to be average or slightly above when compared with other states. Individual cities have discovered weaknesses through these surveys and modified their practice accordingly. The attendance survey showed an amount of absence almost incredible to superintendents and teachers—20 percent of the children out more than 10 percent of the time; 10 percent of the children out more than 20 percent of the time; 6.6 percent of the children out more than 30 percent of the time—not a satisfactory situation. High 'percentages of attendance' have been secured through the method of dropping a child's name from the roll after a period of a day and a half to three days' absence. This, however, does not make for increased school attendance by the child.

In all these studies the random selection of cities and the large number of pupils involved makes it probable that the results are typical of the state. Definite readjustments are known to have been made in a number of school systems on the basis of the facts revealed.

Local Surveys—

(1) In response to direct invitations by superintendents and school boards, more or less complete surveys of four Iowa school systems have been made. Written reports have been rendered to the school boards in each case.

(2) Building surveys involving the question of utilization of present buildings and the best solution for caring for the increased school population have been conducted in three cities.

Local surveys are possible only by the closest cooperation with teachers, superintendents and school boards. Meetings with teachers are arranged where the results of the surveys of instruction are given and the interpretation is carefully explained. These meetings enable the teachers to apply the survey results so as to increase classroom efficiency. Meetings with the school board are also arranged so that information may be given them that will help them to fulfill their functions to the greater good of the schools.

General Service—

(1) The various standard tests have been furnished at cost to the schools of the state. This has kept the Bureau in touch with all schools doing measuring work and fostered the cooperative relationship.

(2) An informational service has been established which endeavors to be a source of help in the solution of school problems. This service is free and open to anyone within the state.

The response of the school superintendents of the state to any projected cooperative work, the large number of calls for surveys of various kinds, and the utilization of the obtained results, furnish the best evidence of the value of the work that has been accomplished. The fact that calls are still coming in for studies issued more than two years ago indicates that the work of the Bureau is considered as having more than temporary value. During the three years and a half cooperative relationship has been established with more than 100 different cities and towns of the state. At the present time I know that when an invitation is extended for cooperative work, a truly representative number of cities and towns can be relied upon to furnish the desired information.

DIFFICULTIES

A fundamental difficulty, and one that often tends to invalidate results, is that a large number of teachers, principals and superintendents have not had an opportunity for training in scientific research work. With the very best intention to cooperate, directions are frequently misunderstood or the importance of their being followed in an absolute manner is not appreciated and thus a variable factor enters into the work. This difficulty can be overcome only by extreme care and preliminary experimentation in the formulation of directions.

Another problem, perhaps even greater than the securing of reliable data, is presented by the question: How shall the results of researches be reported in such a way that the greatest possible good may come to schools? The purpose of the research is the modification of schoolroom practice. In most cases this will be accomplished only when the results reach the teacher in a form which

is clear, definite and usable. It must be remembered that the movement in scientific education in recent years is demanding a new type of supervisor—one trained in the handling and interpretation of scientific data. But until the universities, colleges and normal schools are able to give us this trained corps, and a representative is found in every school, it will be necessary to depend largely upon the classroom teacher for the application of the report to practice. Hence, special effort should be made, first, to present the report in such form that the ordinary teacher may clearly see its meaning and be inspired to utilize the results in her own classroom, and second, to distribute the report in such a manner that it shall come directly to the attention of the teacher herself.

The difficulty of securing adequate assistance in caring for the work presents itself to nearly every bureau. To get reliable data in many studies it is often more necessary to score the papers than to give the tests. This requires much time and clerical assistants with a specific kind of training. Where the director of the bureau is on the regular teaching staff of the institution, he may personally solve this difficulty by the use of research data as laboratory material with his classes. This enables him to train his help and give his students very valuable experience with this kind of work at the same time. A counter-difficulty arises with this plan in that the director is not free for extended absences over the state as calls may require.

State surveys that involve the collection of material in many schools and the compilation and interpretation of results at the central bureau present only the difficulties of securing the needed cooperation in the field and the necessary assistance at the bureau. These can be met. But local surveys present a well-nigh insuperable difficulty in the element of time. Even with a large staff, extensive local surveys could be made in only a few cities in a year. Fortunately, many features of a local survey can be done as well by the local superintendent, if he be a trained man, as by a representative of the bureau. Hence, a partial solution to this difficulty lies in the training of superintendents.

SUGGESTIONS

On the basis of three years and a half experience with the Bureau at the University of Iowa, of frequent conversations with those in charge of similar bureaus elsewhere, I offer the following suggestions to those who contemplate the creation of a similar bureau:

1. The bureau should be so financed as to make available sufficient funds to care for the immediate tabulation of the results of any study conducted by it.

2. A plan should be devised by which the director of the bureau and persons interested in its cooperative activity may meet for consultation one or more times during the year. These meetings might be arranged in connection with the State Teachers' Association or other educational gathering at which a large group of school superintendents would be present.

3. The director should be a member of the teaching staff of the university during its summer session so that through the classroom he may increase the interest in the work of the bureau and assist in the training of teachers, principals and superintendents for educational investigation.

4. Results of researches should be presented to the public, in a clear and forcible manner, attractive to the lay reader and in a form usable by the average teacher. Specific problems should be set up to which specific answers are given. These problems and their answers at least should be intelligible to all readers, even though some readers may not be able to follow clearly all the processes by which the results are obtained.

5. With the issuance of the studies of the bureau, arrangements should be made for a publicity campaign that will focus the attention of the school people upon these results.

HISTORICAL NOTE

Pioneer efforts along the line of cooperative investigation in educational measurements were made in 1910 by S. A. Courtis in arithmetic. One of the outgrowths of his activities was the taking over of the research work within states by state universities. The first university to recognize the possibilities of service through the

formation of a bureau of cooperative research was the University of Oklahoma, in 1913. At this time, however, cooperative work was also under way in the University of Indiana, and the formal organization of the Bureau of Cooperative Research took place the following year. Similar bureaus at the University of Iowa and at the State Normal School, Emporia, Kansas, were organized a little later. A partial list of university bureaus of research (with sufficiently formal organizations to have stationery of their own!) is as follows:

University	Name of Bureau	When Organized	Name of Director
Univ. of Arkansas, Fayette, Ark.	Bureau of Educational Tests and Measure- ments	1917	J. R. Jewell
Univ. of Indiana, Bloomington, Ind.	Bureau of Cooperative Research	1914	(Position unfilled at present)
Univ. of Iowa, Iowa City, Iowa	Educational Service, Ex- tension Division	1914	E. J. Ashbaugh
Univ. of Kansas, Lawrence, Kan.	Bureau of Educational Measurements	1916	F. J. Kelly
Univ. of Minnesota, Minneapolis, Minn.	Bureau of Cooperative Research	1915	M. E. Haggerty
Univ. of Nebraska, Lincoln, Neb.	Bureau of Educational Measurements	1914	Charles Fordyce
Univ. of Oklahoma, Norman, Okla.	Bureau of Measurements and Efficiency	1913	W. W. Phelan
Univ. of South Dakota, Vermillion, S. Dak.	Bureau of Educational Research	1915	W. Franklin Jones

It must not be supposed, however, that the universities that appear in the list above are the only ones actively supporting the movement. From Harvard and Columbia Universities in the east, to Leland Stanford Junior University in the west, from the University of Wisconsin in the north to the University of Texas in the south, similar work is being done by schools and departments of education. If a distinction is to be made at all, it is that the universities that have formal bureaus usually act as distributing centers for testing material, but even this distinction does not always hold. The influence of university men in education has naturally been one of the main factors that have led to the growth of the movement.

The university, moreover, has by no means been the only factor. Normal schools and teachers' institutes have done their share. At present bureaus of research are to be found in at least two normal schools:

Normal School	Name of Bureau	When Organized	Name of Director
State Normal School, Emporia, Ks.	Bureau of Educational Standards and Measurements	1914	Walter S. Monroe
Northern Normal and Industrial School, Aberdeen, So. Dak.	Bureau of Educational Research	1917	Willis E. Johnson

Still another agency for the development of educational research throughout a state has been the state department of education. In at least three of these attention to research work is the special duty of a particular member of the staff.

State	Name of Bureau	When Organized	Name of Director
New York	State Dept. of Education		Wm. A. Averill
Wisconsin	State Dept. of Education	1915	W. W. Theisen
Georgia	State Dept. of Georgia		M. L. Duggan

Probably this is the proper place, also, to comment on the aid rendered by the U. S. Bureau of Education. Bulletins and reports of committees on standard tests and scales have been printed; surveys have been conducted, and in many ways the Bureau at Washington has done what it could to further the cause of measurement.

Finally, tribute must be paid to the influence of the great foundations. The Russell Sage Foundation, through its Division of Education, under the direction of Leonard P. Ayres, was the pioneer in this field and has been one of the major influences responsible for the rapid development of the movement for measurement. The Ayres Scales in writing and spelling are widely used, while the investigations of the Division in the field of cost-accounting and child-accounting have had even greater influence. The survey work carried on by the Division has been a third type of activity that has had a great effect in directing the minds of school men to the possibilities of measurement. The contributions of the foundation to this field are very great.

Of recent years, more and more attention has been given by other foundations to the field of educational research. The Cleve-

land Foundation, although of local origin and interest, has, through the Cleveland Survey, made its contribution to the educational progress of the country. The Carnegie Foundation has recently entered the field.

The General Education Board, also, has given many evidences of its interest in the scientific study of educational problems. It has supported the New Hampshire Bureau of Educational Research, subsidized research work at the University of Chicago and in other places, conducted surveys in the Maryland and Gary schools, and is now carrying on an experimental school.

It seems clear, therefore, that in the future the development of educational measurement should be even more rapid than in the past. At one extreme are great foundations willing to expend large sums of money for any educational investigation that promises to yield results of permanent value. At the other extreme is a vast army of educational workers actively engaged in teaching children and anxious to make use of every tool, device, or method, that will help them to do better work. Between the two are the universities, colleges and normal schools, training men both to carry on research work successfully and to apply the results of experimental studies to the practical problems of the schoolroom.

CHAPTER VII
EXISTING TESTS AND STANDARDS

WALTER S. MONROE

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During the past decade and especially during the past five years, the number of tests available for measuring the abilities of children in school subjects has grown very rapidly. Those described in this chapter are as follows:

STANDARDIZED TESTS FOR USE IN THE ELEMENTARY SCHOOL

Arithmetic	17	Language	17
(Fundamental Operations 11)		Music	1
(Arithmetic Reasoning 6)		Silent Reading	13
Drawing	1	Oral Reading	4
Geography	6	Spelling	11
Handwriting	10	Total	84
History	4		

STANDARDIZED TESTS FOR USE IN THE HIGH SCHOOL

Algebra	7	History	1
Drawing	1	Physical Training	1
Foreign Languages	11	Physics	1
Geometry	3	Total	25

The superintendent or teacher who wishes to measure the results of instruction, faces the problem of making a wise choice from this material. This account of existing tests and standards has been prepared to assist in making this choice. Because of the limitations of space, only brief descriptions are possible. In the chapter prepared by Miss Bryner the reader will find references to the accounts of the derivation of all the tests and of their use, whenever they are available. Most of the tests are also described more completely in the writer's book on *Educational Tests and Measurements*, Houghton Mifflin & Company, 1917.

The standards given in several cases are tentative only and all are, of course, subject to revision. Unless standard scores are based upon a large number of cases, they should be used with caution in making comparisons. In all cases it should be remembered that any standard which is simply a statement of the concensus of present practice is open to the criticism that we must not assume that what is, is what should be. For example, it may be that a high degree of efficiency requires a much higher standard in the rate of silent reading than the average rate at which children now read in the several grades.

It should also be remembered that the scores upon which these standards are based were obtained by following certain definite directions in giving the several tests. Even slight variations in procedure often materially affect pupils' scores. Hence, when comparison with standard scores is the object of the testing work, one should follow the standard, or specified, directions which in most cases accompany the tests. In any case, in making comparisons it is unwise to attach great importance to small differences in scores.¹

An effort has been made to make this list as complete as possible, but doubtless some tests have been overlooked, and it is certain that within a short time new tests will be announced. In fact, several were found that were in the process of derivation. Certain special tests which have been devised for laboratory research are intentionally omitted because they are not available for distribution and in general are not suitable for the type of testing the superintendent or teacher will do. Practice tests or other exercises which are primarily teaching devices have also been omitted.

The tests may be obtained from the addresses given. When no address is given, the tests are not available for general use. Even in a few cases where the address is given, the tests are not available. On account of recent fluctuations in the cost of printing, prices are not stable. Accordingly, no prices are given. However, in only a few cases are the tests published on a commercial basis and for this reason one may be reasonably certain that the tests may be obtained at approximately the cost of printing.

¹S. A. Courtis, *Third, Fourth and Fifth Annual Accountings, 1913-1916*. (Department of Cooperative Research, Detroit). Read especially the warning given on page 53.

STANDARDIZED TESTS FOR USE IN THE ELEMENTARY SCHOOL

I. Arithmetic, Fundamental Operations

1. *Bobbitt's Arithmetic Tests.* These tests were used in the survey of the public schools of San Antonio, Texas. They consist of nine tests, five for the operations with integers and four for the operations with common fractions. Each test is limited to one operation, but contains examples of several different types. However, they are arranged in groups which are equal in difficulty. (Ref. 546.)*

2. *Boston Tests. Addition of Fractions.* These are a series of six tests devised by A. W. Kallom and are significant for the illustration they furnish of tests based upon a scientific analysis of the abilities they measure. This analysis revealed fourteen types of examples in the addition of two fractions, but by making certain combinations the number of tests needed to measure this group of abilities was reduced to six. A similar series has been devised for subtraction of fractions, and it is planned to extend the work to multiplication and division. (Ref. 78.)

STANDARDS: BOSTON MEDIANS: ADDITION OF FRACTIONS

Grade	Pupils Tested	Test 1		Test 2		Test 3		Test 4		Test 5		Test 6	
		Speed Medians	Accuracy Medians	Speed Medians	Accuracy Medians	Speed Medians	Accuracy Medians	Speed Medians	Accuracy Medians	Speed Medians	Accuracy Medians	Speed Medians	Accuracy Medians
VI	1205	10.7	79.6	7.7	65.6	5.5	41.9	4.0	69.5	4.6	51.0	4.4	48.6
VII	1243	16.5	86.6	10.1	72.9	7.3	46.1	5.3	69.2	6.3	54.9	5.7	48.1
VIII	1130	20.7	88.2	11.6	74.4	8.4	47.4	6.0	67.8	6.9	52.4	6.4	46.5

3. *Cleveland Survey Tests.* These were designed for use in the survey of the Cleveland Public Schools. They have been revised slightly and used in the surveys at Grand Rapids and St. Louis. The series consists of fifteen tests, including four in addition, two in subtraction, three in multiplication, four in division, and two in addition and subtraction of common fractions. The total working time is 22 minutes and the administration of the tests is simple. They furnish a more detailed analysis than can be secured by means of the Courtis Standard Research Tests, Series B. Address Charles H. Judd, School of Education, University of Chicago, Chicago, Illinois, or S. A. Courtis, 82 Eliot St., Detroit. (Ref. 403.)

*Reference numbers in this chapter refer to the numbers in the bibliography, Chapter XIII.

AVERAGES OF MEDIAN SCORES IN 15 ARITHMETIC TESTS FOR GRADES 3-8. CLEVELAND AND GRAND RAPIDS. NUMBER OF EXAMPLES RIGHT

Test	Grade					
	III	IV	V	VI	VII	VIII
A	13.4	17.1	21.9	24.9	27.0	28.9
B	8.9	12.8	16.6	19.5	21.1	25.8
C	6.5	11.7	14.8	16.8	18.2	19.9
D	6.3	11.4	15.0	17.7	20.3	22.8
E	4.3	5.0	5.9	6.7	7.4	8.0
F	2.0	4.5	6.6	7.7	9.1	10.6
G	2.0	3.6	5.1	5.5	6.0	6.7
H	...	...	5.6	6.0	7.7	8.6
I	0.6	1.0	1.7	3.1	4.0	4.7
J	1.9	3.0	3.9	4.4	5.1	6.1
K	...	4.0	5.6	7.0	9.4	11.4
L	...	1.7	2.7	3.2	3.8	4.4
M	1.4	2.4	3.4	4.1	4.7	5.4
N	...	0.8	1.1	1.6	1.9	2.4
O	...	...	...	3.3	4.3	5.2

4. *Courtis Standard Tests, Series A.* This series includes eight tests, one for the combinations (0-9) in each of the operations; copying figures, speed reasoning, fundamental operations, and reasoning. The series was devised in 1909 and was used extensively during the following years. However, the author has discontinued its publication in favor of Series B, devised in 1913. (Ref. 91.)

STANDARD MEDIAN SCORES, COURTIS' STANDARD RESEARCH TESTS, SERIES B.

GRADE	Addition		Subtraction		Multiplication		Division	
	Speed	Acc.	Speed	Acc.	Speed	Acc.	Speed	Acc.
IV—General	7.4	64	7.4	80	6.2	67	4.6	57
Courtis	6	100	7	100	6	100	4	100
Boston	8	70	7	80	6	60	4	60
V—General	8.6	70	9.0	83	7.5	75	6.1	77
Courtis	8	100	9	100	8	100	6	100
Boston	9	70	9	80	7	70	6	70
VI—General	9.8	73	10.3	85	9.1	78	8.2	8
Courtis	10	100	11	100	9	100	8	100
Boston	10	70	10	90	9	80	8	80
VII—General	10.9	75	11.6	86	10.2	80	9.6	90
Courtis	11	100	12	100	10	100	10	100
Boston	11	80	11	90	10	80	10	90
VIII—General	11.6	76	12.9	87	11.5	81	10.7	91
Courtis	12	100	13	100	11	100	11	100
Boston	12	80	12	90	11	80	11	90

Speed is the number of examples done in the time allowed.

Accuracy is the percent of examples correct.

"General" medians were determined by Courtis on the basis of the 1916 tabulations and summaries of tabulations of other years. Courtis, S. A. *Third, Fourth, and Fifth Annual Accountings, 1913-16.* (Department of Cooperative Research, Detroit).

The Boston standards were established after using the tests for three years. Ballou, F. W., *Arithmetic, the Courtis Standard Tests in Boston, 1912-15.* (*Bulletin No. 10 of the Department of Educational Investigation and Measurement*).

5. *Courtis Standard Research Tests, Series B.* This series of tests consists of one test in each of the four fundamental operations. The tests measure the speed and accuracy with which the pupil can perform these operations with one type of example. The administration is very simple. The total time required to give them is 26 minutes. They have been used extensively since their first publication in 1914. The measures have been proved reliable in 75 to 90 percent of the cases. Address S. A. Courtis, 82 Eliot St., Detroit, Michigan. (Refs. 77, 97.)

6. *Guhin's Number Tests.* These tests include 88 combinations for both addition and multiplication. The standards are given in terms of the number of seconds required to complete the test. Address Hubb City School Supply Company, Aberdeen, South Dakota.

Standards.	3rd grade, 150	6th grade, 120
	4th grade, 140	7th grade, 110
	5th grade, 130	8th grade, 100

7. *Monroe's Diagnostic Tests.* This series covers the four fundamental operations in integers, common fractions, and decimal fractions. It is thought that they will furnish a reasonably complete diagnosis of the abilities of pupils to perform the operations of arithmetic. Although the series consists of 21 tests, they have been so arranged that the total time required for giving them is only 35½ minutes. Address Bureau of Educational Measurements and Standards, Emporia, Kansas.

8. *National Business Ability Tests.* The tests for addition, subtraction and multiplication are abbreviated forms of the corresponding tests of the Courtis Standard Research Tests, Series B. In addition to these three, there are tests in multiplication of common fractions and in percentage. The standards are stated in terms of the number of minutes allowed for completing the respective tests. Address Sherwin Cody, Managing Director, 189 W. Madison St., Chicago, Illinois.

9. *Stone's Arithmetic Test for the Fundamental Operations.* This test is of historical interest because it was used by Courtis

in the experimentation which resulted in the derivation of Series A. It was designed as a general test and has not been standardized except for the sixth grade. Address Bureau of Publications, Teachers College, Columbia University, New York City. (Ref. 138.)

10. *Thompson's Standardized Tests.* This is an elaborate series of tests upon the operations of arithmetic. The feature of these tests is a mechanical device for scoring the papers. Address T. E. Thompson, Monrovia, California.

11. *Woody's Arithmetic Scales.* These consist of two series of four tests, one for each of the fundamental operations. They differ from such tests as the Courtis Standard Research Tests, Series B, in that the examples in each scale have been carefully graded and arranged in order of difficulty. In content they include integers, decimal fractions, common fractions and denominate numbers.² Series A and Series B are similar, except that Series A is more finely divided. Address Bureau of Publications, Teachers College, Columbia University, New York City. (Ref. 148.)

TENTATIVE STANDARDS OF ACHIEVEMENT FOR WOODY TESTS, SERIES A

Grade	Addition	Subtraction	Multiplication	Division
II	3.12	1.44	...	...
III	4.99	2.96	1.89	2.54
IV	6.11	4.22	4.05	3.21
V	6.99	5.47	5.52	4.94
VI	7.95	6.46	6.72	5.87
VII	8.65	7.31	7.26	6.59
VIII	9.01	7.64	7.93	7.16

TENTATIVE STANDARDS OF ACHIEVEMENT FOR WOODY TESTS, SERIES B

Grade	Addition	Subtraction	Multiplication	Division
II	4.5	3	...	...
III	9	6	3.5	3
IV	11	8	7	5
V	14	10	11	7
VI	16	12	15	10
VII	18	13	17	13
VIII	18.5	14.5	18	14

²Recently there has appeared a modification of the Woody tests known as the Woody-McCall Mixed Fundamentals, Series B, I and II. These tests are more difficult than the original Woody tests. Each sheet has on it problems in all four of the fundamental operations, so that the pupil must choose the right operation for each problem. In exploring for tests best fitted for selecting gifted children in the 5th and 6th grades I have found the Woody-McCall Mixed Fundamentals distinctly better than the Woody tests from which they were derived.—G. M. W.

The standards are expressed in terms of the degree of difficulty of the examples that are done correctly by just 50 percent of the pupils.

II. Arithmetic: Reasoning

1. *Bonser's Reasoning Tests*. These consist of two lists of ten problems each. The problems have been chosen so that the two tests are equal in difficulty. Address Bureau of Publications, Teachers College, Columbia University, New York City. (Ref. 75.)

2. *Buckingham's Reasoning Tests*. These tests were devised for use in the survey of the Gary and Prevocational Schools of New York City. The problems of the tests were carefully evaluated and arranged so that the two lists are equally difficult, but were not scientifically selected. (Refs. 82, 466.)

3. *Courtis' Reasoning Tests*. Tests 7 and 8 of the Courtis Standard Research Tests, Series A (*q. v.*) are reasoning tests.

4. *Rice's Reasoning Tests*. These were given by Rice in 1902 and are of historical interest. They consist of a series of tests, one for each of the grades from fourth to eighth, inclusive. The problems were selected as suitable for the pupils of the respective grades. (Ref. 129.)

5. *Starch's Arithmetical Scale A*. This test consists of a series of arithmetical problems which are arranged in order of increasing difficulty. Address Daniel Starch, University of Wisconsin, Madison, Wisconsin. (Ref. 134.)

The following are standard scores for the ends of the respective years, as derived from 2515 pupils in 18 schools:

Grade	III	IV	V	VI	VII	VIII
Score	4.5	6.2	7.8	9.4	11.0	12.6

6. *Stone's Reasoning Test*. This is a single test designed to be given to Grades IV to VIII, inclusive. The problems have been carefully evaluated. The test was used in the survey of the public schools of Butte, Montana, and Salt Lake City, Utah. Address Bureau of Publications, Teachers College, Columbia University, New York City.

STANDARDS. MEDIAN SCORES FOR THE STONE REASONING TEST

Grade	Butte	Bridgeport	Salt Lake City	18,495 Wisconsin Pupils
V	2.7	6.1	4.3	2.4
VI	4.4	5.2	6.9	3.9
VII	6.3	6.8	9.1	5.4
VIII	8.2	4.5	11.0	6.9

Recently Stone has issued the following standards:

“That 80 percent or more of 5th-grade pupils reach or exceed a score of 5.5, with at least 75 percent accuracy; that 80 percent or more of 6th-grade pupils reach or exceed a score of 6.5, with at least 80 percent accuracy; that 80 percent or more of 7th-grade pupils reach or exceed a score of 7.5, with at least 85 percent accuracy; that 80 percent or more of 8th-grade pupils reach or exceed a score of 8.75, with at least 90 percent accuracy.” (Ref. 139.)

III. Drawing

1. *Thorndike's Drawing Scale.* This scale, devised by E. L. Thorndike, in 1913, consists of a series of drawings arranged in order of merit as determined by competent judges. Address Bureau of Publications, Teachers College, Columbia University, New York City. (Ref. 159.)

IV. Geography

1. *The Boston Tests.* The two tests of this series—one on the United States and the other on Europe—consist of well-chosen questions. The relative difficulty of the questions was determined upon the basis of the percent of correct answers. The tests were devised in an effort to determine: (1) the character of achievement in geography and (2) the possibility of scientific measurement of educational results in geography. This significant comment is made: “The results show how inadequate the customary examination or test in geography is to measure ability in geography.” (Ref. 216.)

2. *Buckingham's Geography Test.* This test was devised for use in the survey of the Gary and Prevocational Schools of New York City. It consist of two sets of 20 questions which were evaluated upon the basis of the percent of correct responses. (Ref. 466.)

3. *Hahn-Lackey Geography Scale.* This scale consists of several hundred geographical questions which were found to be com-

mon to six modern texts and which satisfied certain other criteria. These questions have been classified according to difficulty. In appearance the scale is very much like the Ayres' Spelling Scale and is to be used the same way. Address H. H. Hahn, Wayne State Normal School, Wayne, Nebraska.

4. *Starch's Geography Tests, Series A.* The common elements of five geography texts have been arranged in five parallel tests. The exercises of the tests are in the form of mutilated sentences. Address Daniel Starch, University of Wisconsin, Madison, Wisconsin.

5. *Thompson's Standardized Tests in Geography.* These consist of a test each for North and South America. They deal entirely with place geography. An important feature is a mechanical device for scoring the papers. Address T. E. Thompson, Monrovia, California.

6. *Witham's Standard Geography Tests.* These are a series of tests arranged to test quickly and easily pupils' knowledge of certain geographical facts. The facts for the tests on the world are grouped under these heads: (1) geographical divisions, (2) form and motion of the earth, (3) the hemispheres, (4) land and water forms, (5) homes of the races, (6) industries, and (7) largest cities. Address E. C. Witham, Southington, Conn. (Ref. 221.)

V. Handwriting

The scales described below are used to measure the quality of handwriting. The speed of handwriting is measured by having suitable material written under specified conditions for a definite number of minutes. In order that a measurement of speed may be most significant, it must be made when the quality of the pupil's handwriting is approximately standard.

"Pupils should be asked to write a suitable selection which they have memorized. To guard against lapses of memory, the pupils should be asked to repeat in concert the selection to be used. If convenient, it is well to provide each pupil with a printed or type-written copy of the selection. When this cannot be done, the selection may be written on the blackboard where all can see it. The selection should contain no words which the pupils cannot spell

readily. It is well to have them practice writing the more difficult words before the test is begun. Do not use material which the pupils must compose as they write, for this would be worthless in testing. The rate of writing unfamiliar material from a printed copy will vary with the pupils' rate of reading and so will not give a true measure of speed. Dictated material should be used only when the teacher wishes to control the speed, not when speed is to be measured.

"Different investigators have required pupils to write different material. Several have used the first line or the first stanza of the poem, 'Mary had a little lamb.' 'Sing a Song of Sixpence' has been used. Other sentences which have furnished copy are 'Jolly kings bring gifts while happy maids dance.' 'A quick brown fox jumps over the lazy dog.'³ 'Then the carelessly dressed gentleman stepped lightly into Warren's carriage and held out a small card. John vanished behind the bushes and the carriage moved along down the driveway.'⁴ In the Cleveland Survey the first three sentences of Lincoln's Gettysburg Address were written, and Ayres has used the same selection in the 'Gettysburg Edition' of his scale. In several surveys the pupils were allowed to write any familiar stanza of a poem. The chief principles to bear in mind in selecting materials are: first, to use material in the lower grades which will not furnish difficulties in spelling and remembering; and second, to use material which will be uniform in all classes which are to be compared.'⁵

1. *Ayres' Scale for Measuring the Handwriting of School Children.* This is known as the "Three Slant Edition," or more simply as the Ayres Scale. It consists of three types of specimens of the handwriting of school children—vertical, semi-slant and full slant—arranged in order of legibility as determined experimentally. The values 20, 30, 40, up to 90, have been assigned to the specimens. This scale has been used very widely. Address Russell Sage Foundation, New York City. (Ref. 227.)

³This sentence was used in securing specimens for the Freeman Scale. It contains all the letters of the alphabet.

⁴These sentences were used in securing the specimens for the Thorndike Scale.

⁵Walter S. Monroe, *Educational Tests and Measurements*, p. 146. Houghton Mifflin Company, 1917.

2. *Ayres' Scale for Measuring the Quality of Handwriting of Adults.* This scale is similar to that described above, except that specimens of the handwriting of adults are used instead of the handwriting of school children. Address Russell Sage Foundation, New York City. (Ref. 229.)

3. *Ayres' "Gettysburg Edition."* This scale differs from the other two in certain important characteristics. It consists of specimens of school children's handwriting on ruled paper and there is only one specimen for each division of the scale instead of three representing different degrees of slant. The copy, the first three sentences of Lincoln's *Gettysburg Address*, is the same for all specimens. The scale has printed on it standards for both speed and quality and complete directions for its use. Ayres asserts that the purpose of the new features is "to increase the reliability of measurements of handwriting." Address Russell Sage Foundation, New York City.

4. *Breed and Downs' Scale.* This scale was constructed in making a survey of the handwriting in the public schools of Highland Park, Michigan. The specimens were scored by means of the Thorndike Scale and then certain ones selected for a five-step scale for each of the following grades, 3d A, 3d B, 4th A, 5th A and 6th A. Thus, it differs from other scales in having a special scale for each of the grades named. (Ref. 234.)

5. *Courtis' Standard Research Tests, Handwriting, Series W.* Test I, Handwriting, is an untimed "maximum performance" test, designed to secure samples of the children's best writing after practice. Test II, Filing Test, is a "free-choice" copying test, designed to secure samples of the children's writing under working conditions. The test consists of the names and addresses of ten business firms, to be copied in alphabetical order. In both tests the quality of the writing is to be measured with the Ayres scale. The difference in quality between the two samples reveals any "lack of transfer" from the work of the writing class to ordinary writing. The material in the Filing Test has been so chosen as to afford excellent material for an analysis of the defects in the writing of a particular child. Address S. A. Courtis, 82 Eliot Street, Detroit, Michigan.

6. *Freeman's Handwriting Scale*. This scale differs from the others in that there is one scale for each of the following characteristics of handwriting: (1) uniformity of slant, (2) uniformity of alignment, (3) quality of line, (4) letter formation, and (5) spacing. Only three degrees of each characteristic 1, 3 and 5, are included in the scale, although the intermediate values, 2 and 4, may be used. This scale is designed for diagnosis rather than general measurement. Address Houghton Mifflin Company. (Ref. 240.)

7. *Gray's Score Card*. This score card is of the same general character as those which are used in judging grain and livestock. It is based upon a determination of the important characteristics of handwriting. Its function is similar to that of the Freeman scale, i. e., to furnish a diagnosis rather than a general measurement. Address C. T. Gray, University of Texas, Austin, Texas. (Ref. 245.)

8. *Johnson and Stone's Scale*. This scale is similar in general plan to the Ayres and Thorndike Scales, but based on several factors, including movement and a detailed analysis of legibility. Each specimen of the scale is accompanied by a legend which states its defects and merits in terms of the analysis appended, which includes seven factors—letter formation, uniformity of slant, uniformity of alignment, spacing, quality of line, size, and degree of slant. (Ref. 247.)

9. *Thorndike's Scale*. This scale was constructed on the basis of three characteristics—beauty, legibility, and general merit. The degree of these characteristics represented in the specimens of the scale was determined by the consensus of opinion of competent judges. The numerical values of the specimens of the Thorndike Scale range from 4 to 18, and one or more specimens are given for each degree of quality. Address Bureau of Publications, Teachers College, Columbia University, New York City. (Ref. 263.)

10. *Zaner and Blossom Handwriting Scales*. These are a series of scales for the several grades, designed to be used with a particular system of handwriting. Address Zaner and Blossom Co., Columbus, Ohio.

STANDARD MEDIAN SCORES. SPEED OF HANDWRITING

Source	Grades							Approximate number of specimens scored
	II	III	IV	V	VI	VII	VIII	
Cleveland ⁶	39.2	...	...	60	70	76	80	25,387
Iowa Schools ⁷	39.2	49.2	61.9	65.5	72.6	75	76.5	28,000
Starch's Standard ⁸ .	31	38	47	57	65	75	76.5	4,740
Kansas Medians ⁹ . . .	32	35	51	61	67	71	73	6,000
Fifty-six cities ¹⁰ . .	30.6	43.8	51.2	59.1	62.8	67.9	73	34,000
Freeman's Standards	36	48	56	65	72	80	90	

STANDARD MEDIAN SCORES: QUALITY OF HANDWRITING

Source	Grades							Scale used	Approximate number of specimens scored
	II	III	IV	V	VI	VII	VIII		
Cleveland	...	...	...	45	48	50	55	Ayres	25,287
Iowa Schools	35.7	39.8	44.5	49.1	52.3	57	55	Ayres	28,000
Starch's Standard	27	33	37	43	47	53	57	Ayres	4,740
Kansas Medians	44	47	50	55	59	64	70	Ayres	6,000
Fifty-six cities	39.7	42	45.8	50.5	54.5	58.9	62.8	Ayres	34,000
Freeman's Standards . . .									
(Ayres Scale)	44	47	50	55	59	64	70	Ayres	
Salt Lake City ¹¹	...	9.2	10.7	11.1	11.3	12.2	12.8	Thorn-dike	2,500
Butte, Montana ¹²	8.2	8	8.8	8.9	11.6	11.2	12.1	Thorn-dike	1,400
Southington, Conn. ¹³	...					10		Thorn-dike	1,200
Connersville, Ind. ¹⁴	...	10.3	10	10.3	11.7	11.7	11	Thorn-dike	
Freeman's Standards (Thorndike's scale)	9.36	9.75	10.13	10.76	11.34	11.89	12.66		

VI. History

1. *Buckingham's Tests.* These tests were used in the survey of the Gary and Prevocational Schools of New York City. They consist of two sets of questions which have been evaluated on the basis of the percent of correct answers. More recently Bucking-

⁶Judd, Charles H., *Measuring the Work of the Public Schools. Report, Survey Committee on the Cleveland Foundation*, 1916.

⁷Ashbaugh, E. J., *Handwriting of Iowa School Children. University of Iowa, Extension Division, Bulletin No. 15*, March 1916.

⁸Starch, D., *The Measurement of Efficiency in Reading, Writing, Spelling, and English. University of Wisconsin*, 1914.

⁹DeVoss, J. C. *Second Annual Report of Bureau of Educational Measurements and Standards. Kansas State Normal School, Emporia, Kansas.*

¹⁰Freeman, F. N., *Fourteenth Yearbook of this Society, Part I*, 1915. See also the *Sixteenth Yearbook, Part I*, 1917, Ch. IV.

¹¹*Report of a Survey of the Schools of Salt Lake City, Utah*, (1915).

¹²*Report of a Survey of the Schools of Butte, Montana*, Ch. IV (1914).

¹³Witham, E. C., *All the Elements of Handwriting Measured. Educational Administration and Supervision*, 1; 1915, pp. 313-24.

¹⁴Wilson, G. M., *The Handwriting of School Children. Elementary School Teacher*, 6; 1911, pp. 450-53.

ham has studied the relation between the ability to remember historical facts and the ability to use them. In this study specially devised tests were used. (Ref. 466.)

2. *The Bell and McCollum Test.* This test consists of a series of questions which have been very carefully selected because of their importance. The topics included are: (1) dates-events, (2) men-events, (3) events-men, (4) historic terms, (5) political parties, (6) divisions of history and (7) map-study. The test can be administered in a forty-minute period. (Ref. 270.)

3. *Harlan's Test of Information in American History.* This is a test of historical information based upon the study of Bagley and Rugg, "The Content of American History Texts." Address Chas. L. Harlan, College of Education, University of Minnesota, Minneapolis, Minn.

4. *Starch's American History Tests, Series A.* This test is based upon the facts and principles common to five modern texts. The exercises are in the form of mutilated sentences. Four duplicate forms are available. Address Daniel Starch, University of Wisconsin, Madison, Wis.

VII. Language

1. *Breed and Frostic Scale.* The compositions used by Breed and Frostic in deriving their scale were written by sixth-grade pupils under uniform conditions. A part of a story called *The Picnic* was read to the class, and they were given 20 minutes to complete it. The method of selecting compositions for the scale and determining scale values was similar to that employed by Hillegas. (Ref. 165.)

2. *Courtis Standard Tests in English.* See Reading, below.

3. *Harvard-Newton Composition Scale.* The Harvard-Newton Composition Scale consists of four separate scales, one for each form of discourse; argumentation, description, exposition, and narration. Each of the scales consists of six compositions written by eighth-grade pupils and arranged in order of merit as determined by the marks assigned by teachers, rating them as eighth-grade compositions. For each composition there is given a statement of the most significant merits and defects. Address Harvard University Press, Cambridge, Mass. (Ref. 161.)

STANDARDS. MEDIAN SCORES FOR HARVARD-NEWTON SCALE

Grade	Number of Composition	Median Scores
VIIb	67	60
VIIa	72	64
VIIIb	68	66
VIIIa	61	69
IXb	57	68
IX	61	68

4. *Hillegas Scale for the Measurement of the Quality in English Composition for Young People.* This consists of ten compositions ranging from an artificial production, whose scale value is zero, to the tenth composition, whose scale value is 9.3. Three of the ten compositions are artificial productions, five were written by high-school pupils, and the remaining two by college freshmen. No two were written on the same topic and they vary greatly in length and type. Each degree of merit is represented by only one composition. (Ref. 172.)

STANDARDS FOR THE HILLEGAS SCALE

Grade	Salt Lake City	Butte	Trabue: Median Score	Trabue: Score above which three-fourths of pupils should rank
IV	2.9	2.34	3.5	3.0
V	3.1	2.87	4.0	3.5
VI	3.8	3.40	5.0	4.0
VII	4.4	3.75	5.0	4.5
VIII	5.4	4.11	5.5	5.0
IX	...	...	6.0	5.5
X	...	...	6.5	6.0
XI	...	...	6.9	6.4
XII . . . . .	....	...	7.2	6.7

5. *Nassau County Supplement.* The Nassau County Supplement to the Hillegas Scale consists of nine compositions, seven of which were written by elementary-school pupils on the topic "What I should like to do next Saturday." The compositions of the scale were carefully selected and evaluated by an elaborate method which cannot be even sketched here. Copies may be obtained from the Bureau of Publications, Teachers College, Columbia University, New York City. (Ref. 203.)

6. *Thorndike's Extension of the Hillegas Scale.* This extension is similar to the original scale, except that a larger number of compositions have been used, thereby making a more finely divided scale as well as providing several compositions for each degree of merit in the middle of the scale. Address Bureau of Publications, Teachers College, Columbia University, New York City.

7. *The Trabue Completion-Test Language Scales.* Trabue has devised a series of Completion-Test Language Scales for the general measurement of language ability. Each scale consists of sentences from which one or more words have been omitted. The position of the omitted words is indicated by a blank. The pupil is to write in the missing words. The relative difficulty of the sentences has been carefully determined, and they have been arranged in order of difficulty. It is claimed for these tests that a pupil's "language ability" is very closely related to his score on these scales. Copies may be obtained from the Bureau of Publications, Teachers College, Columbia University, New York City. (Ref. 202.)

STANDARDS: TRABUE COMPLETION-TEST SCALES

Grade	Median	Grade	Median
II	3.0	VIII.	13.3
III	6.0	IX	14.2
IV	8.0	X	15.3
V	9.6	XI	15.8
VI	11.0	XII	16.2
VII	12.3		

8. *Willing's Scale.* Willing used compositions written by pupils in Grades four to eight on the topic "An Exciting Experience." Several particular exciting experiences were suggested, and 20 minutes was allowed for writing. In determining the compositions to be used for the scale, "all errors in spelling, punctuation, capitalization and grammar were counted and corrected." The compositions selected as samples for the scale were those which had the same rank in "story value" and frequency of errors. Address Bureau of Measurements and Standards, Emporia, Kansas. (Refs. 504, 513.)

For the Denver Survey the following median scores were obtained:

Grade	4th A	5th A	6th A	7th A	8th A
Median	31.5	43.4	50.9	60.2	63.4

9. *Buckingham's Grammar Test.* In making the survey of the Gary and the Prevocational Schools of New York City, Buckingham used a series of questions upon English grammar. These questions were carefully evaluated upon the basis of difficulty. They have been re-arranged and published by Haggerty. (See below.) (Ref. 466.)

10. *Charters' Grammar Test.* This test consists of sentences containing an incorrect form. The pupil is to write the sentence in the correct form and give the grammatical reason for doing so. The incorrect grammatical forms were selected from the errors occurring in the oral and written speech of pupils. Address W. W. Charters, University of Illinois, Urbana, Illinois.

11. *Haggerty's Grammar Test.* Same as Buckingham's, with the questions re-arranged and printed in convenient form. Address Bureau of Cooperative Research, University of Minnesota, Minneapolis, Minnesota.

12. *National Business Ability Tests.* These include two tests on grammatical form and one on punctuation. In the grammar tests the pupil is to choose between two forms which are given. Address Sherwin Cody, Managing Director, 189 West Madison St., Chicago, Illinois.

13. *Starch's Grammatical Scales.* Starch has devised three scales (A, B, and C) to measure a pupil's ability to use correctly certain language forms. His Grammatical Scale A consists of a series of exercises arranged in order of increasing difficulty. As tentative standards of attainment Starch gives the following scores for the use of these scales (Ref. 214):

Grade.....	VII	VIII	IX	X	XI	XII	Freshmen
Score	8.0	8.3	8.6	8.9	9.2	9.5	10.3

14. *Starch's Punctuation Scale.* Starch has also devised a Punctuation Scale which is similar in form to the Grammatical Scales. The exercises consist of sentences to be punctuated. The following are tentative standard scores of attainment for the ends of the respective school years:

	Grades		High School				University
Year	7	8	1	2	3	4	3
Score.....	8.0	8.3	8.6	8.9	9.2	9.5	10.3

15. *Starch's Grammatical Tests.* Starch has also devised three tests for measuring directly a pupil's ability to recognize certain language forms. In Test 1 the pupil is asked to mark the part of speech of each word in a certain printed text. His score is the number he designates correctly in three minutes. Test 2 calls for the

designation of the case of the nouns in another printed test. Test 3 has to do with the tense and mode of verbs.

STANDARDS: STARCH'S GRAMMATICAL TESTS

	Grades		High School				University
Year.	7	8	1	2	3	4	3
Score, Test 1	30	33	36	40	43	46	60
Score, Test 2	13	16	20	23	26	30	45
Score, Test 3	13	16	20	23	26	30	45

Address Daniel Starch, University of Wisconsin, Madison, Wisconsin.

16. *Thompson's Research Test in Grammar.* This is a test of the pupil's ability to indicate the part of speech in a list of words. The feature of the test is a mechanical device for scoring the papers. Address T. E. Thompson, Monrovia, California.

17. *Boston Copying Test.* This test was devised to measure the ability of pupils to copy printed matter. In giving the test, each pupil was provided with a printed selection which he was asked to copy with pen and ink. In marking the papers the following errors were noted: in spelling, capitalization, punctuation, undotted i's, uncrossed t's; in omitting words, in adding words, in wrong words used, and in misplaced words. (Ref. 164.)

The errors noted consisted of nine different kinds, and the number of each kind made in this test by 4494 pupils is shown by the following tabulation:—

Spelling	5,829
Capitalization	644
Omitted words	4,077
Added words	606
Wrong words used	840
Misplaced words	105
Punctuation	5,876
Undotted i's	8,794
Uncrossed t's	606
Total	27,377
Average errors per pupil	5.54

VIII. Music

1. *Seashore's Musical Talent Chart*. This chart is based upon the analysis of musical ability and offers a graphic means of representing the pupil's musical ability. Address Carl E. Seashore, University of Iowa, Iowa City, Iowa.

IX. Silent Reading

1. *Brown's Silent Reading Test*. This test consists of a very interesting reading selection, which is used in Grades III to VIII. Duplicate selections of equivalent difficulty are obtainable. The directions require that the children read the selection silently for exactly one minute, then draw a line around the word which they have reached when the examiner calls "Stop." The number of words read makes the score in speed.

The children are then asked to write as much as they can remember of what they have read. A key is provided for the examiner to use in scoring the papers. On it are listed all the separate ideas contained in the selection. By comparing the child's papers with the key, the examiner determines how many different points there are in what the child read. Then his reproduction is examined carefully to determine (1) quantity and (2) quality of comprehension. Address, Bureau of Research, 25 Capitol St., Concord, New Hampshire. (Refs. 286, 287, 288.)

STANDARDS: TENTATIVE SCORES WITH THE BROWN SILENT READING TEST

	Words per Second	Comprehension	Reading Efficiency
Grade III	3.32	46	127.8
Grade IV	3.55	65	217.1
Grade V	4.40	61	291.0
Grade VI	4.54	68	295.0
Grade VII	4.65	78	322.3
Grade VIII	4.84	79	323.6

2. *Courtis Standard Research Tests in English*. These are a series of tests devised by Courtis to measure speed and comprehension of silent reading. The series of tests was so complex that the marking of the test papers was a laborious task. For this reason the publication of the tests has been discontinued. (Ref. 291.)

3. *Courtis Research Tests Silent Reading (Series R, Test 2)*. This test is suitable for Grades I to VI. It measures a phase of read-

ing ability acquired in Grades II, III, and IV. In the first part of the test the children read a simple child's story under normal conditions. From this work a measure of the rate of reading is derived. In the second part of the test the paragraphs of the story are reprinted and under each are given five simple questions about the paragraphs. The questions may be answered by "yes" or "no" and they are designed to measure a child's comprehension of the relation existing between the essential elements of the story. The tests are available in two forms of nearly equal difficulty, so that measurements may be made at the beginning and end of the year. Address S. A. Courtis, 82 Eliot Street, Detroit, Michigan. (Ref. 293.)

COURTIS SILENT READING: SERIES R, TEST 2
(Median Grade Scores at the End of the Year)

Grade	II	III	IV	V	VI
Words read per minute	84	113	145	168	191
Questions answered in 5 minutes	16	24	30	37	40
Index of comprehension	59	78	89	93	95

4. *Fordyce's Scale for Measuring the Achievements in Reading.* This scale consists of a selection to be read, upon which the pupils are required to answer certain questions that have been weighted for determining the comprehension score. The speed of reading is found by having the pupils mark the word they have reached at the end of the stated interval. In order that all may have the information necessary for answering the questions, the pupils are then directed to finish the story. Address the University Publishing Co., Lincoln, Nebraska.

STANDARDS IN PERCENTS: FORDYCE SILENT READING TEST

Test No. 1, designed for Grades III, IV and V.			
Grade	III	IV	V
Speed	90	95	100
Quality	57	71	74
Test No. 2, designed for Grades VI, VII and VIII.			
Grade	VI	VII	VIII
Speed	90	100	100
Quality	41	45	50

5. *Gray's Silent Reading Tests.* These tests consist of three selections, one for Grades II and III, one for Grades IV, V, and VI, and another for Grades VII and VIII. The selections are so arranged on the pages that the time required to read one hundred words can be readily ascertained. Only one child is tested at a time.

After completing the reading, the child, if in the second or third grade, tells the story to the examiner, who writes it down. In the grades above the third, the child writes all he can remember of the story, and then writes answers to a set of questions which is furnished him by the examiner. The child's score for quality of reading is assigned on the basis of two factors, reproduction and accuracy. Reproduction is determined by the number of words which remain in the child's composition, after all wrong or irrelevant statements and repetitions are stricken out. Accuracy is determined on the basis of ten points for each correct answer. The quality mark is the average of these two. Address William S. Gray, School of Education, University of Chicago, Chicago, Illinois. (Refs. 297, 300a.)

STANDARD SCORES FOR GRAY'S SILENT READING TESTS

Grade	II	III	IV	V	VI	VII	VIII
Rate (words per second)	1.50	2.30	2.20	2.57	2.79	2.69	2.87
Quality	32	37	29	32	39	22	27

6. *Haggerty's Visual Vocabulary Tests.* The tests prepared by Haggerty, of the Bureau of Cooperative Research, School of Education, University of Minnesota, are but a slight modification of the Thorndike Visual Vocabulary Scales, with the addition of an oral test for children of Grades I and II. This test will be described under the heading of "Oral Reading." Scale R2, of which there is one sheet for children of Grades III and IV and another sheet containing part of the same words and additional more difficult words for Grades V, VI, VII and VIII, is devised in exactly the same way as the Thorndike scales. Methods of scoring are somewhat more simple, and the lists are briefer than those used by Thorndike. Forms of equivalent difficulty are obtainable. Address Bureau of Cooperative Research, University of Minnesota, Minneapolis, Minnesota. (Ref. 301.)

7. *Kansas Silent Reading Tests.* These tests were devised by F. J. Kelly. Both speed and comprehension of reading are combined in a single mark. These tests consist of graded lists of exercises which have been carefully evaluated. Each exercise consists of the directions for doing something, which is very simple after the pupil has fully understood the directions. His comprehension

of the exercise is measured by what he does. Test I is for Grades III, IV, and V; Test II for Grades VI, VII and VIII; Test III for Grades IX, X, XI, and XII. Address Bureau of Educational Measurements and Standards, Emporia, Kansas. (Refs. 314, 315.)

STANDARDS: MEDIAN SCORES, KANSAS SILENT READING TESTS
(Based upon more than 100,000 Scores)

Grade.....	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Twenty-five percentile . .	2.5	6.1	9.4	9.4	11.8	13.7	16.0	17.9	18.7	22.3
Median Score	5.3	9.5	13.2	13.9	16.2	19.2	22.9	25.6	26.5	29.7
Seventy-five percentile . .	8.2	13.6	17.5	19.8	21.9	26.4	30.4	31.9	33.1	34.1

8. *The Minnesota Scale Beta.* This is slightly modified form of Thorndike's Scale Alpha (*q. v.*) It is printed in a form which is more convenient for use. This scale is issued in two forms which are approximately equal in value. Address Bureau of Cooperative Research, University of Minnesota, Minneapolis, Minnesota.

9. *Monroe's Standardized Tests in Silent Reading.* In these tests those features of the Kansas Silent Reading Tests which have proved satisfactory have been incorporated. The exercises have been secured from school readers and other books which children read. Test I is for Grades III, IV and V; Test II for Grades VI, VII, VIII; Test III for Grades IX, X, XI, and XII. These tests are issued in three forms which are equivalent in value. Address Bureau of Educational Measurements and Standards, Emporia, Kansas.

10. *Starch's Silent Reading Tests.* These tests are similar to Brown's Silent Reading Tests described above, except that different selections are used for the different grades. Address Daniel Starch, University of Wisconsin, Madison, Wisconsin.

STANDARDS: MEDIAN SCORES IN STARCH SILENT READING TESTS
(Attained at the Close of the Respective Years)

Grade or Years.....	I	II	III	IV	V	VI	VII	VIII
Speed (words per second) . . .	1.5	1.8	2.1	2.4	2.8	3.2	3.6	4.0
Comprehension (words written)	15	20	24	28	33	38	45	50

11. *Starch's English Vocabulary Tests.* These tests are lists of one hundred words, each selected at random from a dictionary.

The child is asked to check the words, the meaning of which he is certain, and to write the meaning after the words of which he is in doubt. The score is the percent of words thus checked or correctly defined. These tests measure the extent of the pupil's vocabulary, regardless of the value of the words. Address Daniel Starch, University of Wisconsin, Madison, Wis.

The following are tentative standard scores for the various years as determined from tests made in four schools (Ref. 333):

	Elementary					High School				University			
Years	4	5	6	7	8	1	2	3	4	1	2	3	4
Scores	30	33	36	39	42	45	47.2	50	53	56	58.5	61	63

12. *Thorndike's Visual Vocabulary Scales.* Thorndike is the author of three visual vocabulary scales: Seale A, Scale A2 and Scale B. The latter two represent extensions of the former, and were derived by the same method. Seale A2 and Seale B are intended for use alternately or interchangeably, and each is issued in three forms. Each scale consists of graded lists of words, the meaning of which the pupil is to indicate by assigning the words to certain classes. Address Bureau of Publications, Teachers College, Columbia University, New York City.

Standards: No standards have as yet been derived by the use of the Thorndike Seale A2 or Scale B with large numbers of public school children. In the following table the standards of achievement by the use of the Thorndike Scale A (with which the values on Seales A2 and B are supposed to be identical) are given, and serve as tentative standards for purposes of comparison. The score values were obtained by the measurement of the pupils in 18 cities in Indiana. (Refs. 336, 342.)

MEDIAN SCORES IN VISUAL VOCABULARY BY THE THORNDIKE SCALE A

Grades	III	IV	V	VI	VII	VIII
Median Score	4.00	5.26	6.00	6.66	7.29	7.91
Number of Children	1650	2095	2028	1860	1625	1313

13. *Thorndike's Scale Alpha and Alpha 2 for Measuring the Understanding of Sentences.* Scale Alpha 2 is a slightly more elaborate edition of Alpha. Each scale consists of a carefully graded

series of paragraphs. Each paragraph is followed by several questions which the child is to answer as he reads the paragraph. The pupil's answers to the questions determine the measure of his comprehension. In the *Teachers College Record* which describes the derivation of this scale, there is given a score card for marking the answers to these questions. Address Bureau of Publications, Teachers College, Columbia University, New York City. (Refs. 340, 343.)

The following table gives the median scores for the pupils in 18 cities in Indiana, as reported by Haggerty.

MEDIAN SCORES IN UNDERSTANDING OF SENTENCES BY THE THORNDIKE SCALE ALPHA

Grades.....	III	IV	V	VI	VII	VIII
Median.....	5.48	6.56	7.56	8.46	8.72	9.00
Number of pupils.....	1650	2095	2028	1860	1625	1313

X. Oral Reading

1. *Gray's Oral Reading Test.* This test consists of twelve paragraphs, arranged in order of increasing difficulty. The relative difficulties have been established experimentally. The child's oral reading of each paragraph is checked for time, and for each of six types of errors: gross errors, minor errors, omissions, substitutions, insertions, and repetitions. Address William S. Gray, School of Education, University of Chicago, Chicago, Illinois. (Ref. 297.)

2. *Haggerty's Visual Vocabulary Tests.* For Grades I and II these consist of two sheets, one of eight words and the other of phonetic words selected from the Jones test. The words on either sheet are grouped into lists according to difficulty. This difficulty was determined by trial with several hundred primary children. A value is attached to each word according to its ascertained difficulty. The child is asked to pronounce the words aloud; his score is the value attached to the most difficult list of which he can pronounce four out of five words correctly. Two equivalent forms are available. Address Bureau of Cooperative Research, University of Minnesota, Minneapolis, Minnesota. (Ref. 301.)

3. *Jones' Visual Vocabulary Tests.* Selecting ten of the most widely used primers, Jones found the frequency of occurrence in all the primers of each word occurring in any of them. He used this frequency as a measure of the value of each word. Using the

values thus determined for each word, lists of words were made up as tests. The score is the sum of the values attached to the words which the pupil can pronounce correctly. Address R. G. Jones, Cleveland, Ohio. (Ref. 308.)

4. *Price's Oral Reading Tests.* These consist of a series of suitable oral reading exercises for Grades II to VIII, inclusive. Two forms are available for each grade. Pupils are scored for words mispronounced, words inserted, words omitted, words transposed and number of words read. Address Supt. E. D. Price, Enid, Oklahoma.

XI. Spelling

1. *Ayres' Spelling Scale.* This scale consists of a list of the one thousand most frequently used words of the English language. These were determined by means of careful analysis of written material, ranging from friendship letters to some of our best prose. Later the words were classified according to frequency of misspelling for each of the several grades, and the percent of correct spellings for each grade was printed at the head of each list. These standards are for the words when used in dictated lists and without regard to whether the words have been taught in the respective grades or not.

Strictly speaking, Ayres' Spelling Scale is not a scale or test, but a list of words from which tests can be made to measure the ability of pupils to spell the foundation words of the English language. The next four tests were constructed by using words from Ayres' list. Address Russell Sage Foundation, New York City. (Ref. 352.)

2. *Courtis Standard Research Tests in Spelling.* In these tests words chosen from suitable columns of Ayres' Scale are embedded in sentences, and the sentences are arranged so that they can be dictated at specified rates, which correspond to the rate of writing in the several grades. Each test includes 20 words. The standards set by Courtis are slightly lower than Ayres' Standards for the same words when dictated as isolated words. Address S. A. Courtis, 82 Eliot St., Detroit, Michigan.

3. *The Iowa Dictation Exercise and Spelling Tests.* These tests, prepared by E. J. Ashbaugh, of the Extension Division, University of Iowa, consist of twenty words embedded in sentences and

an equal number to be dictated separately. Each of the sentences has been constructed so that it is to be written in 30 seconds. Test I is for Grades III and IV, Test II is for Grades V and VI and Test III is for Grades VII and VIII. Address E. J. Ashbaugh, Iowa City, Iowa.

4. *The Nebraska Spelling Test.* This test, prepared by Dean Chas. Fordyce, of the University of Nebraska, consists of twenty words embedded in sentences which are to be dictated at rates specified for the several grades. The same words are used for all grades. Address Dean Chas. Fordyce, Lincoln, Nebraska.

5. *Monroe's Timed Sentence Spelling Tests.* These tests differ from the foregoing in that 50 words are used and no test words occur at the end of a sentence. This last feature protects the slow writer. Test I is for Grades III and IV, Test II is for Grades V and VI and Test III is for Grades VII and VIII and for the high school. The normal rate of writing was determined by measuring the speed of 6,000 Kansas school children. Address Bureau of Educational Measurements and Standards, Emporia, Kansas.

6. *Boston Minimum Spelling Lists.* These consist of a list (for each grade) of "commonly used but often misspelled words." These words have been standardized for the grades in which they are to be taught, and hence constitute lists from which words for testing may be selected. Address Department of Educational Investigation and Measurement, Boston, Mass. (Ref. 355.)

7. *Buckingham's Spelling Scale.* Starting with a list of about 5,000 words common to at least two out of five spelling books, Buckingham by means of an elaborate statistical procedure, selected two lists of 25 words each. The purpose of the selection was to secure "words which were easy enough in the third grade and hard enough in the eighth grade to afford a test in those and therefore intermediate grades, and which showed regular increases in percent correct from grade to grade." The difficulty of each word was determined in terms of a common unit. Since the difficulty of each word is known, the entire list, or any desired portion of it, may be used as a test. Address Bureau of Publications, Teachers College, Columbia, University, New York City. (Ref. 358.)

8. *Jones' Concrete Investigation of the Material of English Spelling.* This bulletin presents the results of an investigation to determine "what words, 'grade for grade,' do children use in their own free written speech, and which, therefore, they need to know how to spell." This list has been used as the basis for the construction of tests. One such test has been devised by W. W. Phelan, University of Oklahoma, Norman, Okla., and used extensively in that state. For the *Bulletin*, address University of South Dakota, Aberdeen, South Dakota. (Ref. 370.)

9. *National Business Ability Tests.* The elementary test consists of 50 words chosen from Ayres' list of 542 obtained from the examination of two thousand letters. The advanced spelling test consists of a list of 50 words which are printed incorrectly. In ten minutes the pupil is to write the words correctly. Address Sherwin Cody, 189 West Madison St., Chicago, Illinois.

10. *Rice's Spelling Test.* This test has a very great historical importance because it was Rice's report on spelling at the meeting of the Department of Superintendence in 1897 that marks the beginning of the modern movement for scientific measurement in education. (Ref. 378.)

11. *Starch's Spelling Scales.* These scales have a function which differs from that of Ayres' Scale or a test made from Ayres' list. The latter measures how well pupils can spell the most commonly used words of the English language, while Starch's test measures the size of one's spelling vocabulary. The tests consist of words selected at random from the non-technical words of the English language, with no regard to the frequency with which they are used. Address Daniel Starch, University of Wisconsin, Madison, Wisconsin.

Standards: Starch gives the following standards for his tests based on their use with over 2,500 pupils.

Grade.....	I	II	III	IV	V	VI	VII	VIII
Percent of words spelled correctly	10	30	40	51	61	71	78	85

These standards are interpreted thus: the average eighth-grade pupil should be able to spell correctly 85 percent of the non-tech-

nical words of the English language, or 85 of the 100 words in any one of Starch's tests. (Ref. 384.)

TESTS FOR USE IN THE HIGH SCHOOL

Certain tests of those described in the preceding pages are intended to be used in the high school, as well as in the elementary school. These are Test III of the Kansas Silent Reading Tests, the Thorndike Scale Alpha for Measuring the Understanding of Sentences, Starch's English Vocabulary Test, certain composition scales, the copying test, the Trabue Completion-Test Language Scales, and Starch's Grammatical Tests. For the description of these tests and the use of them, the reader is referred to the preceding pages.

In addition to these tests, many of the others have been applied to high-school pupils. For example, the Courtis Standard Research Tests in Arithmetic, Series B, have frequently been given to high-school pupils, although many of them were not studying arithmetic. However, in applying such tests to high-school pupils it should be remembered that the tests were not designed for that purpose, and it may be expected that they will not be as satisfactory as when used in the way intended.

I. Algebra

1. *Coleman's Scale for Testing Ability in Algebra.* This test consists of a series of exercises arranged in order of difficulty. Address Supt. W. H. Coleman, Bertrand, Nebraska.

2. *Hotze's First-Year Algebra Scales.* These scales include tests on the following topics: (1) addition and subtraction, (2) multiplication and division, (3) equations and formulas, (4) graphs, (5) problems. They were restricted to these topics because the author felt "that the main business of the work in first-year algebra was to teach students how to solve typical algebra problems through the use of algebraic symbols." Address Bureau of Publications, Teachers College, Columbia University, New York City.

3. *Indiana Algebra Tests.* Monroe's Standard Research Tests in Algebra, described below, were incorporated in this series. The other six tests of the series were devised by H. G. Childs, of the University of Indiana. (Ref. 58.)

4. *Monroe's Standard Research Tests in Algebra.* These consist of a series of six tests. Each of the first five tests is designed to measure the ability to do one of the operations occurring in the solution of simple equations. Address Bureau of Educational Measurements and Standards, Kansas State Normal School, Emporia, Kansas. (Refs. 60, 61.)

STANDARDS: MEDIAN SCORES FOR MONROE'S STANDARD RESEARCH TESTS IN ALGEBRA

Test.....	I	II	III	IV	V	VI
Number of pupils	2077	1993	2107	2127	2198	1992
Speed, number of ex- amples attempted	14.6	5.4	11.5	10.2	11.2	8.3
Accuracy, percent of ex- amples correct	96	41	100	94	77	32

5. *Stromquist's Preliminary Algebra Tests.* This series of tests includes tests upon the following operations: (1) addition, (2) subtraction, (3) multiplication, (4) division and (5) factoring. Address, University of Wyoming, Laramie, Wyoming.

6. *Rugg and Clark Standardized Tests in First-Year Algebra.* This series includes sixteen tests which are intended to measure all of the types of exercises in the work of the first year. Address H. O. Rugg, University of Chicago, Chicago, Ill. (Ref. 66.)

TENTATIVE STANDARDS FOR RUGG & CLARK FIRST-YEAR ALGEBRA TESTS
(Approximate Median Number of Problems Attempted per Minute
for Each Test)

Test	2	5	6	7	8	10	11	12	13	14	15
Most efficient school.....	4.2	14.5	6.3	13.4	4.6	3.0	4.2	3.5	1.1	7.3	1.4
Average of upper third of 27 schools	3.5	11.6	5.8	12.5	4.1	1.5	3.2	2.9	1.0	5.8	2.5
Ninth school	3.2	10.7	5.5	11.5	3.9	1.2	2.8	2.6	0.8	5.2	3.9
Average of 27 schools	3.0	10.4	4.9	11.2	3.6	1.1	2.7	2.4	0.8	4.9	3.1
Poorest school	2.2	6.5	2.8	7.9	2.4	0.5	1.5	1.4	0.5	2.9	

(Approximate Median Number of Problems Right.)

Most efficient school	3.2	13.2	5.4	11.8	4.1	1.4	2.8	2.8	0.9	5.3	2.0
Average of upper third of 27 schools	2.7	11.0	4.8	10.7	3.5	0.8	1.6	2.0	0.7	3.9	4.2
Ninth school	3.2	10.0	4.4	9.0	2.9	0.5	1.2	1.7	0.6	3.4	5.9
Average of 27 schools	2.2	9.7	3.8	9.2	2.9	0.5	1.1	1.4	0.6	2.8	7.9
Poorest school	1.2	6.1	2.2	4.3	1.7	0.2	0.1	0.5	0.3	0.1	

Standards for Tests 1, 3, 4, 9 and 16 will be sent to cooperating schools during 1917.

Score for Test 15 is minutes required to solve one problem.

7. *Thorndike's Algebra Test*. This is a series of eight exercises arranged in order of increasing difficulty as determined by the opinion of competent judges.

II. Drawing

1. *Rugg's Scale for Measuring Freehand Lettering for Use in Secondary Schools and Colleges*. It consists of a series of 8 samples of freehand lettering, arranged in the order of increasing merit. It may be used in measuring the efficiency of a student's work in freehand lettering. Address H. O. Rugg, School of Education, University of Chicago, Chicago, Ill. (Ref. 156.)

III. Foreign Language

1. *Brown's Connected-Latin Test*. This test consists of a connected passage of Latin, to be interpreted in terms of its thought content. The pupils are given a specified amount of time in which to interpret and write in English as much of the passage as possible. The translation is scored by means of a key.

2. *Brown's Latin-Sentence Test*. This consists of a series of Latin sentences ranging from very easy to very difficult. The sentences are graded and evaluated, and each is assigned a scale value.

3. *Brown's Formal Latin-Vocabulary Test*. A list of fifty isolated words which have been graded and evaluated and a scale value assigned to each. The pupils are scored on their ability to give correct meanings for the words.

4. *Brown's Functional Latin-Vocabulary Test*. A list of words in the Latin-Sentence Test. The pupils are scored on their ability to re-act to these words correctly in their functional relationships in sentences.

5. *Brown's Formal Latin-Grammar Test*. This test is made up of twenty constructions in Latin sentences. The constructions are in italics and the pupils are required to name and describe them, but not to translate the sentences.

6. *Brown's Functional Latin-Grammar Test*. A series of Latin constructions chosen from the Latin-Sentence Test. The pupils are graded on their ability to react correctly to these constructions in their normal settings.

With the foregoing six tests a survey was made of the work in Latin in New Hampshire secondary schools. The high schools of every city and every large town in the state were tested. Most of the private academies and seminaries were also reached. The results are to be set forth in a document entitled *A Study of Ability in Latin*. This will consist of about 300 pages when printed and will be published by the Bureau of Educational Research of the New Hampshire Department of Public Instruction, Concord. For further information address President H. A. Brown, State Normal School, Oshkosh, Wisconsin. (Ref. 277.)

7. *Hanus' Latin Tests*. These consist of four tests for vocabulary, a translation test, and a grammar test. All of these tests are based on Caesar and Cicero. No words appear in the vocabulary tests "which occur less than one hundred times in Caesar and Cicero." The translation test "contains only constructions which are found at least five hundred times in Caesar and Cicero." The grammar test is based on the sentences to be translated. Address Paul Hanus, Harvard University, Cambridge, Massachusetts. (Ref. 278.)

8. *Henmon's Latin Tests*. These consist of (1) an easy hundred-word vocabulary test—50 in English and 50 in Latin—containing the words that are common to four widely used first-year books, (2) a standard vocabulary test of 239 words representing all the words common to 13 first-year books and to Caesar, Cicero, and Virgil, (3) a Latin-sentence test consisting of 30 sentences constructed by using none but the 239 words of the Standard Vocabulary Test. Address V. A. C. Hennon, University of Wisconsin, Madison, Wis.

9. *Starch's French Vocabulary and Reading Tests*. The vocabulary test consists of 100 French words selected at random from a French dictionary. The English equivalents of these words are given on the test sheet, and the pupil is tested by means of the number of English equivalents he can correctly associate with the French words. The reading test consists of simple sentences to be translated.

10. *Starch's German Vocabulary and Reading Tests*. These are similar to the tests for French. Copies of these tests may be obtained from Daniel Starch, University of Wisconsin, Madison, Wisconsin.

11. *Whipple's German Vocabulary Test*. This is a vocabulary test to measure the ability of graduate students to read scientific German in the field of educational psychology. A score of 60 has seemed to indicate sufficient ability to read psychology and education in German. Address Guy M. Whipple, Carnegie Institute of Technology, Pittsburgh, Pa.

IV. Geometry

1. *Minnick's Geometry Tests*. This series of tests is based on the assumption that the demonstration of a geometrical theorem involves the following abilities: (1) the ability to draw the figure, (2) the ability to state the hypothesis and conclusion, (3) the ability to recall facts concerning the figure, (4) the ability to select and organize facts so as to produce the proof. Address J. H. Minnick, University of Pennsylvania, Philadelphia, Pennsylvania.

2. *Rogers' Mathematical Tests*. These are a series of tests designed to measure several types of reasoning ability in the field of mathematics. The series includes tests on arithmetic and algebra as well as geometry. Address Bureau of Publications, Teachers College, Columbia University, New York City.

3. *Stockard and Bell's Geometry Test*. This test consists of 70 questions arranged in 20 groups. "These groups involve drawing figures, naming figures, indicating order of development in demonstration, completing statements, stating of converse, definitions, regular polygons, parts of a demonstration, angular relations, area of trapezoid, angles in polygons, angles in circles, congruency of triangles, similarity of triangles, loci, auxiliary lines, simple constructions, ratio and proportion, algebraic expression of geometrical relations, and equivalent construction. The questions are asked in such a way that many pupils are able to complete the list in forty minutes." (Ref. 223.)

V. History

1. *Sackett's Scale in Ancient History*. This scale consists of a series of eight tests, or exercises, the questions of which call for the essential information in the field of ancient history. The items of this information were determined upon the basis of a careful examination of an American history text and the judgment of

experts in the field. Address L. W. Sackett, University of Texas, Austin, Texas. (Ref. 273.)

VI. Physical Training

1. *Rapeer's Scale for Measuring Physical Education.* This is a score card for judging five aspects of the results of physical education, *i.e.*, health, physiological efficiency, physical development, physical ability and mental qualities. Address L. W. Rapeer, San Juan, Porto Rico.

VII. Physics

1. *Starch's Tests in Physics.* The tests consist of 75 sentences from which certain words have been omitted. The sentences and the words to be omitted have been so chosen that a pupil cannot supply the correct words unless he knows certain physical facts or principles. The facts, principles, and laws upon which these sentences are based were determined by examining five widely used textbooks. The 102 facts, principles, or laws which were treated by all five of the books are the ones which the pupils must know to do the tests correctly. Address Daniel Starch, University of Wisconsin, Madison, Wisconsin.

DISTRIBUTING CENTERS

Information in regard to particular tests can always be obtained by writing directly to the authors. Very many of the tests and scales, however, can also be secured from various distributing centers, principally University Bureaus of Cooperative Research. For the convenience of those interested, the addresses of the six most important distributing agencies are given below:

1. Bureau of Publications, Teachers College, Columbia University, New York City.
Tests by Thorndike, Stone, Hillegas, Trabue, Woody, Bonser and many others.
2. Russell Sage Foundation, Division of Education, New York City.
Ayres Writing and Spelling Scales.

3. S. A. Courtis, 82 Eliot Street, Detroit, Michigan.
Research Tests in Arithmetic (Series A and B), Reading (Series R), Writing, (Series W), Spelling, (Series S).
4. School of Education, University of Chicago, Chicago, Illinois.
Gray's Reading Tests, Cleveland Arithmetic Tests, Rugg's Algebra Tests.
5. University Supply Association, Madison, Wisconsin.
Tests by Starch and Henmon.
6. Bureau of Educational Tests and Standards, Kansas State Normal School, Emporia, Kansas.
Tests by Monroe, Kansas Silent Reading Tests.
7. Bureau of Cooperative Research, University of Minnesota, Minneapolis, Minnesota. Tests by Haggerty.

Very often schoolmen who undertake measurement work without previous training meet difficulties in the scoring and tabulating of the results, or in interpreting them, which they are unable to overcome without assistance. Ordinarily, this assistance can be had for the asking from any worker in the field, but particularly from Departments of Education in State Universities. A letter, or better a personal visit, will often not only clear up in a few minutes a misunderstanding that otherwise might have led to failure and discouragement, but also bring into mutually helpful relations the so-called theoretical and practical educational forces of the state. The supreme service of educational testing is that it reveals problems, stimulates attempts at solution, and affords measures of the success of the efforts made, but even the simplest educational problems are so important, so complex, that they demand the united co-operative efforts of educational workers of every type.

CHAPTER VIII

RELATED FORMS OF EDUCATIONAL INVESTIGATION

W. A. AVERILL

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The broadest interpretation of the title of this chapter includes everything in the whole school world which remains over and above the measurements of classroom work discussed in the other chapters of this Yearbook. It would call for the consideration of a formidable array of topics of all sorts—from the dust content of school-room air to the nature and results of educational legislation—a range quite beyond the possibilities of this part of the Yearbook. Accordingly, the aim of this chapter will be two-fold; (1) to call the attention of superintendents to the different types of investigations being made, and (2) where investigations are of a conventional type, as cost accounting, study of enrolment, etc., to indicate present tendencies, rather than to give a detailed statement of the entire field.

Content of the Course of Study. Possibly the most significant type of investigation, as well as one immediately related to classroom measurement, is the analysis of the curriculum, both in elementary and high schools, with special reference to the content of the courses of study and to the relative amount of time devoted to the different subjects. Ayres' investigations in spelling have pointed the way to the elimination of waste in accomplishing given results and have shown which words among the thousands taught were proper tasks for the children of the various grades. Similarly, the investigations of Bagley and Rugg in history,¹ Jessup in arithmetic, and others of the same type have served to indicate the methods by which a scientific curriculum may eventually be constructed.

Pupils' Marks and Scholarship Ratings. Another type of investigation most intimately related to classroom measurement is the

¹For these and other references consult the bibliography, Chapter XIII.

study of the marks given pupils by teachers. Two growing tendencies are worthy of mention; first, superintendents are recording and studying the marks received by a class in order to discover what percentage of the pupils receive superior, satisfactory and poor ratings, and they are rating teachers, and making adjustments of work, on the basis of comparative percentages of failure; second, they are accumulating such data from year to year and subjecting them to careful statistical and graphical analysis. That is, school men are no longer content to hope and believe that their work is going well; they are attempting systematically to secure exact knowledge of the effects of their efforts by a scientific study of all available data.

Rating the Teacher's Efficiency. Immediately related to the measurement of the work of the pupils is the estimate of the teacher's ability. The tendency appears to get away from general comment and to record specific details about the recitation itself. A rating card of the general type contains such questions as:

Does the teacher show skill in habit formation?

Does the teacher show skill in stimulating thought?

Is the subject matter organized?

Are proper habits of action developed both in and out of the classroom?

Is the teacher interested in the life of the community?

A rating card which goes into particulars contains such questions as:

Number of minutes lost in calling the class?

Number of minutes lost in distributing material?

Extent to which the recitation was confined to the text? Related to the pupils' lives and experiences?

Number of questions which caused the pupils to think before answering? Number requiring merely yes-or-no answers?

Another tendency of teacher rating takes the form of self-examination, of which the following is an illustration:

Clearing up pupils' difficulties.

1. What plan or method have I for discovering the difficulties which the class as a whole may have, and specific difficulties which individuals may have? For providing the particular help a pupil needs to clear up his own difficulty?

2. When a large enrolment makes it practically impossible to provide the special help needed by individuals, what is my method of providing it?

3. Do I appreciate that a pupil may lose a half year or a full year as the result of my failure to give him just the help he needs at the time he most needs it?

4. Am I inclined to shift the responsibility for pupils' failure to causes outside myself?

5. What evidence have I that I am successful in clearing up pupils' difficulties?

Still another important type of investigation connected with the rating of teachers, and one which is rapidly growing in favor, is the study of stenographic reports of actual recitations.

Promotions and Non-Promotions. The question as to the number of pupils promoted at the close of the term arises naturally after mention of the teacher's efficiency. In the limited space of this chapter it is enough to call attention to the fact that superintendents are finding it desirable to record separately the following types of promotion:

1. The mid-term promotion, where the pupil has spent about half the regular time in each of two grades.

2. The double promotion, in which the pupil is made to skip an entire grade.

3. The straight, earned promotion to the next higher grade.

4. The un-earned promotion, meaning that the pupil has not "passed," but has been in one grade so many terms that there is no longer any benefit in keeping him there.

5. The conditional or trial promotion.

6. The failure, or non-promotion.

7. The demotion to a lower grade.

In comparisons of different cities, investigators should have these distinctions in mind, otherwise they may not be comparing the same things. In other words, the tendency in this field, also, is to define more sharply the analysis that is made.

Teachers' Reasons for Pupils' Failures. The causes of non-promotion are a well-known subject of investigation and report, but often the investigation is limited to asking the teachers to write opposite the name of each non-promoted pupil a reason for the failure. Under these conditions teachers will usually ascribe about 40 percent of the failures to the pupils' mentality and 20 percent to

the pupils' lack of application. Here, too, the tendency is to push the analysis further and demand reasons based upon 'objective evidence.

Elimination. Closely associated with the examination of figures relating to promotions, is the consideration of the extent to which pupils have dropped out of school before promotion time. In the past it has been customary not to count as non-promoted any pupils who have dropped out before examination. This improves the showing, but in line with modern tendencies it is proving more valuable in getting at actual school facts to keep a record of the following types of withdrawal and to give them their full weight in any use which is made of promotion figures.

1. Transfer to another part of the same public-school system.
2. Transfer to schools without the local system.
3. Removal from city with an implied continuance of schooling.
4. Schooling stopped for the current term:
 - a. Poor health.
 - b. Bona fide cases of "needed at home"
 - c. Actual poverty.
5. School given up as a bad job:
 - d. Incapacity
 - e. Indifference
 - f. Disciplinary.

Vocational Education. Early investigations of the causes of withdrawal from school, particularly those which recorded the statements of pupils and parents, as in the Minneapolis survey, brought out the fact that neither pupils nor parents regarded schooling beyond the grades as of very material aid in gaining a livelihood. A few studies were made, correlating wages and salaries with time spent in school. Then the rapid growth of manual training, shop courses, and definite training for the industries, supplied material for a whole literature of vocational investigation and survey. This soon passed beyond the content of the curriculum to the industries themselves, culminating in the thoroughgoing survey of the Cleveland type, in which the whole city is analyzed vocationally and the data, quantitative as well as qualitative, are practically and constructively related to the schools and their program. It is interesting to note that in this connection, the first chapter of the Bloom-

ington, Indiana, survey report treats of the occupations of the women and the men employed in the city.

Ages of Pupils and Progress Through School. It would be presumptuous to re-state the principles of age and progress research so clearly outlined by Dr. Leonard P. Ayres in his *Laggards in our Schools* and *The Identification of the Misfit Child*. The nine categories of pupils that result from the possible combinations of three age and three progress factors are appearing year by year in a larger number of superintendents' reports. The tendency to get away from a liberal margin of "years of normal age" which would enable any city to have a comfortable preponderance of "normal" pupils is in keeping with the demands of modern supervision and research. "To obtain for one city a record which will exceed the record of other cities" may serve the purpose of self-congratulation, but the more nearly correct picture of the situation which is obtained by using a single year age-limit for each half-grade (as is now done in New York State) is far more valuable, if less flattering, to the local superintendent. Present practice figures age at the time of *beginning* a given grade or completing it, rather than "being in a grade" some time during the school year, and the preference is for the time of beginning. The actual statistics may be gathered any time during the early autumn. Bachman advances good reasons for figuring ages on August 31, the beginning of the official school year; the superintendents of New York State have chosen September 15 for the age date. The investigations of age, progress, elimination and retardation have become far too numerous to list separately in a chapter of this length. A new type of investigation is, however, to be seen in the occasional attention given in these studies to the exceptionally capable pupils who have been almost forgotten in our efforts in behalf of their more unfortunate classmates.

Cities and Villages Studied in Groups. For the investigation of enrolment by grade, elimination, age and progress through school, the New York State Education Department has divided the cities, villages and union high schools with elementary departments into groups based on the elementary enrolment. By means of mechanical tabulation, the data supplied by several hundred communities

throughout the state are quickly tabulated, analyzed, and returned to the systems which contributed the information. Returns will be made, it is believed, in time to be of use to the superintendents early in the next school term. Beginnings in this form of 'educational accounting' have been made in the principal cities of the state and in 12 cities with an elementary enrolment 3,000 to 5,000; 26 with 1,000 to 3,000; 44 villages with 500 to 1,000; 58 with 300 to 500; 227 enrolling 100 to 300 elementary pupils and about 100 union schools with fewer than 100 elementary pupils. The superintendents of these school systems will be glad to exchange data with *systems of like size* throughout the country.²

Superintendents willingly receive comparisons of their systems with others of like size similarly situated. The first reaction toward this matter is an attempt to *explain away* the retardation and other defects; it is only afterwards that the problem of *doing away* with it is attacked. Reducing the figures to common denominators of size, wealth, foreign elements and shifting population wins the confidence and cooperation of superintendents and principals and paves the way for constructive work. The mechanical tabulation of the returns also makes possible the correlation of progress-through-school with such factors as teachers' salaries, principals' salaries, number of pupils per teacher, per capita assessed valuation of the school district, number of hours devoted daily to supervision by the principal, and in small schools, the number of grades taught by one teacher.

Investigations Giving Rise to Permanent Records. It is of interest to follow the usual course of many investigations of the type mentioned thus far in this chapter. Often the first stimulus to action is a questionnaire received by the superintendent; next a survey of classroom work is made with standard tests; then an age-progress survey follows, and the superintendent begins to incorporate into his report some of the outcomes. Soon the giving of standard tests and the statistical study of school records become a part of his regular work. Finally the items of information necessary for these investigations become the subjects of permanent record in the superintendent's office and appear regularly in his report.

²Address W. A. Averill, State Education Bldg., Albany, N. Y.

Groups of Related Investigations. There should be mentioned here quite an array of investigations, largely correlated with retardation, progress and the achievements of pupils as measured by standard classroom tests, which for want of space can only be listed.

Studies having to do with

1. Physical conditions of the children in school (hearing, eyesight, development, etc., medical inspection, school lunches, heating, ventilation, school furniture, etc.).

2. Home conditions (sleep, breakfast, play, home study, outside work, etc.).

3. Special classes (blind, deaf, mentally defective, tubercular, super-normal, special promotion plans, coaching rooms, supervised study, etc.).

4. School organization (school programs, recesses, fatigue, vacations, division of school year, kindergarten, junior high schools).

5. Compulsory attendance (delinquency, discipline, truancy).

6. Social and moral welfare.

Organization of City School Systems. Different in type though related are investigations dealing with the organization and administration of city school systems, as represented by the work of Cubberley, Strayer, Thorndike and others. Attention is centered on the functions of the different officers of the system, and the chief purpose is perhaps to determine the proper alignment of the functions of the school board and the superintendent. The conception of a school organization in which the superintendent supervises the educational work and a coordinate business officer manages the finances and school plant, is being abandoned in favor of an organization in which the superintendent, as the chief executive officer of the board, is, next to the board itself, the head of the entire system, and the one to whom all other officers, both business and educational, are subordinate. Investigations in educational legislation show this same trend. Legislation recently passed in New York State gives every city a school organization on the plan just mentioned.

School Buildings. An important series of investigations is that dealing with the subject of school buildings. The surveys made in Cleveland, Oakland and Milwaukee are typical. The grouping of types of school architecture by decades, as in the

Cleveland survey, is a significant modern tendency. Sanitation and hygiene naturally play a large part in these studies, as do ventilation, illumination and safety from fire. Related to this group are occasional investigations of janitor service.

Extension and Social Service. Much has also been said and written about the wider use of school buildings—their use at night and in vacations, school-board policies with reference to permitting various organizations to use school buildings and charging for their use. These surveys, however, lead into the field of community welfare and belong rather to the adult world.

The Cost of Educational Work. Finally, no investigation of educational conditions or work can be considered complete which does not show the cost of obtaining the results achieved. The earlier investigations of cost were largely devoted to teachers' salaries; indeed, for many years salaries and "other expenses" were about all that could be culled from school accounts. Now, investigations of school cost fall into three categories: (1) those dealing with the classification of payments for school purposes, (2) those treating of the accounting procedure which gives the desired classification and (3) studies of comparative cost by items, schools and cities.

The present tendencies may be stated as follows:

The school budget is designed according to function, or the kind of work done or service rendered. The four main functions are (1) regulative and executive service, (2) property (acquisition, construction, equipment, maintenance, and operation), (3) instructional, or supervision and teaching, and (4) extension and social service.

School moneys are appropriated by main functions only, all details of expenditure are left to the board of education.

The classification of expenditure involves four things about every payment made, namely, (1) the function subserved, (2) the character of the payment as a fiscal transaction, (3) the detailed object of the expenditure and (4) the location in the system to which it is chargeable.

The accounting procedure itself has been simplified by abandoning large unwieldy forms in favor of smaller loose-leaf sheets; by using flexible code symbols at the top of columns; by using voucher-checks and warrants in place of the old forms of voucher

jacket; and by the standardization of the size of all blanks and cards to the new dimensions used commercially.

Accounts have been rendered more valuable by including a register of orders, a register of accounts payable and an appropriation ledger showing at any time the unencumbered balance as well as the unexpended balance.

Finally the information obtained is reduced to proper units for comparative analysis—per capita units, for instructional functions and square and cubic foot units for building, maintenance and operation functions. Graphic presentation is employed where ever possible.

Modern Office Methods and Equipment. As a subject for present and future investigation, mention should be made of the equipment of superintendents' and school board offices and "modern business methods" of handling clerical work and routine. The adding machine, the calculating machine and the slide-rule will enable one or two clerks to perform a surprising amount of statistical work. The T-square and ruling pen are easily mastered tools for graphic presentation. Time for research is often to be gained by a reorganization of office routine and the elimination of unnecessary records and procedures. Finally, larger systems can solve many of these problems by resorting to the mechanical tabulation of statistics, both educational and financial.

Conclusion. The breadth of the field presented by educational investigations as a whole has made their mention in this chapter disconnected and their discussion, when possible at all, so brief as to be perhaps inadequate. After all, we must revert to the subject of the other chapters of this Yearbook—the measurement of the educational work itself—as that which is most important, because it is most closely related to the purpose of the schools, the education of the children who attend them. Other types of investigation should serve to throw all possible light on the local system in which given educational results appear. They should be of aid in effecting that interpretation of classroom work which will make for fair criticism and constructive suggestion. In fine, these related forms of educational investigation stand as an interpretative background to the more special measurements that mark the achievements of pupils in the schools.

CHAPTER IX

STATISTICAL TERMS AND METHODS

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As educational reports multiply, it becomes increasingly evident that there is undesirable variation in both their method and language. A standard procedure and terminology will be helpful, both to makers and to readers of reports. Moreover, the application to education of statistical methods developed in other fields needs to be made clear. It is the purpose of this paper to state what appears to be the best practice and to note the assumptions on which the practice is based.

In certain sciences a higher degree of accuracy is required than is possible with a single measurement. Accordingly, many measurements are made of the same magnitude, and their average taken as the true amount. It was early ascertained that these measures showed a certain definite arrangement, in accordance with which values at or near the average of all the measures were of greatest frequency, and measures which differed from the average were less frequent the greater their difference from it. Further, it was found that the number of measures greater than the average was likely to be equal to the number less than the average by the same amount. The graphical representation of this kind of a series took the form which we have lately become familiar with as the 'normal' or 'probability' surface (see Figure 2). Measures which differed from the average were thought of as being in error, and this led to the development of what has been called the "theory of error"—a theory involving the symmetrical arrangement of measures of the same thing about the true measure as represented by their average.

The assumption was next made that there was an analogy between a series of measurements of the same thing, and a series

of single measurements of each of a number of individuals alike in some important characteristics. This analogy was found to work out very well for biological data. Economical data, on the other hand, do not appear to afford the same analogy, and since, prior to the recent application of statistics to education these methods have been used mainly by biologists and economists, statisticians were divided into two schools—the one adhering to the doctrine of the theory of error, the other rejecting it. The biologists, broadly speaking, belong to the former and the economists to the latter school.

The evidence is strong that educational measurements tend to resemble those of biology in their structure, *i. e.*, that the theory of error applies. Published results often fail to reveal this, but when such is the case, it is almost always due to scanty data, or to the selection of the children, or to the measuring instrument itself.

It is to be understood that the validity of the statements in the succeeding pages of this chapter rests on the assumption that educational measurements substantially conform to the arrangement which exists among many measurements of the same thing, *i. e.*, that they conform somewhat closely to the theory of error, and exhibit approximately 'normal distribution.'

A *variable* is a quantity which under the conditions imposed may assume different values throughout the discussion. In repeated measurements of the same thing, the obtained measures differ through 'error.' In education, where we make numerous single measurements of different pupils grouped together on the basis of some common characteristic, each different value constitutes a value of the variable. The number of problems solved correctly by seventeen girls in an upper eighth-grade class was as follows: 9, 3, 7, 8, 5, 6, 7, 6, 5, 7, 5, 6, 4, 8, 7, 4, 5. Each different number in this series is a value of the variable "performance of upper eighth-grade girls in solving specified problems in arithmetic."

Attention must be given to the nature of the units in which the variable is expressed. They may indicate *mid-points* or *lower limits*, and they are influenced by the accuracy of the measurements

upon which they are based. In the Nassau County Supplement to the Hillegas scale, the samples have the following values: 0, 1.1, 1.9, 2.8, 3.8, etc. If a person reports *to* the nearest scale value, he is using each value as a mid-point, and his rating of a composition as 1.9 will mean that it is nearer to 1.9 than it is to 1.1 or to 2.8; in other words, his 1.9 will mean from 1.5 to 2.35. If, however, he rates a composition as 1.9 which has at least the merit of the scale sample at 1.9, but not as much merit as the sample at 2.8, he is using the scale-value as a lower limit, and his 1.9 will mean from 1.9 to 2.8. If he reports values between those given on the scale such that a composition slightly less meritorious than the one at 1.9 would be given a value of 1.8 or 1.7, and one slightly more meritorious than the one at 1.9 would be given a value of 2.0 or 2.1, then he is attempting to secure a greater degree of accuracy, and his 1.9 would mean 1.85 to 1.95. Thus, the same rating may have materially different meanings. It is necessary, therefore, that the units be accurately defined and that they be given the same meaning throughout a given discussion.

A *series* in statistics is a grouping of the obtained measures of the variable by steps or classes. According to the nature of the units, series may be either discrete or continuous. A *discrete* series is composed of separate integers. If we record the number of children in each class in a school system, all of our measures will be of this nature. For example, between classes of 20 children and classes of 21 children there can be no measures. A *continuous* series, on the other hand, is one which is capable of an indefinite degree of sub-division. The height of children, their weight, the time they take to do a given task, their general intelligence, their ability in specific ways, all of these when measured yield continuous series. We may represent the height of a child as 60 inches, or his mental age as 10 years. In these cases, however, our measures are only short-hand expressions for ranges whose mid-point is the measure as reported. Persons reported as 60 inches in height may be anywhere between 59.5 and 60.5 inches. Most measurements in education yield continuous series. Even when series, taken at their face value, are discrete, such as the numbers of problems solved, they should be treated as continuous series, because

in the abilities which they are supposed to indicate, no gaps occur. To say that in a certain class six pupils got 10 examples right, only indicates that they had an ability which permitted them to work 10 examples correctly, but not 11. Their abilities might be more accurately represented, if we had material with which to do it, by 10, 10.27, 10.5, 10.84, etc.

Measures when first received are unorganized, and no definite impression may be obtained unless their number is very small. The first procedure is to divide them into classes. For example, 700 measures were obtained from eighth-grade boys who wrote Test No. 15 of a series of "Progressive Spelling Tests." The test consisted of 50 words. Clearly 700 measures in a hap-hazard arrangement convey almost no information as to how well these boys performed. We may classify the measures, as in Table I, by indicating the number of boys who spelled no words correctly, one word correctly, two words correctly, etc. This table consists of 51 classes.

TABLE I

DISTRIBUTION OF 8TH-GRADE BOYS ACCORDING TO THE NUMBER OF WORDS THEY SPELLED CORRECTLY "PROGRESSIVE SPELLING TESTS," No. 15

No. of Words Correct	No. of Pupils	No. of Words Correct	No. of Pupils	No. of Words Correct	No. of Pupils
0	7	17	15	34	22
1	14	18	20	35	15
2	9	19	19	36	16
3	6	20	18	37	12
4	11	21	25	38	20
5	13	22	20	39	13
6	18	23	20	40	11
7	11	24	14	41	14
8	11	25	15	42	7
9	13	26	20	43	9
10	9	27	23	44	5
11	13	28	22	45	2
12	8	29	22	46	3
13	17	30	25	47	4
14	12	31	19	48	2
15	19	32	24	49	1
16	14	33	18	50	0
				Total	700

Although Table I brings the measures into an orderly arrangement, it does not show the structure of the series as clearly as does Table II which is derived from it, and which exhibits but 10 classes.

TABLE II
DERIVED FROM TABLE I

No. of Words Correct	No. of Pupils
0- 5	60
6-10	62
11-15	69
16-20	86
21-25	94
26-30	112
31-35	98
36-40	72
41-45	37
46-50	10
Total	700

In this table each group of measures, *e. g.*, 0 to 5, 6 to 10, etc., is called a class.¹ For the Class 6 to 10, 6 is called the *lower limit*, and 10 the *upper limit*. The *class interval* is the difference between the upper and lower limits. In this instance the class interval is 5 words. The number of measures within each class interval is called the *frequency* of the class, and its conventional symbol is "f." The entire tabular arrangement, consisting of classes and their frequencies, is called a *frequency table* or *frequency distribution*.

On the one hand, it is desirable in the interest of accuracy that the number of classes of a frequency table be large, in order that the intervals may be small. Obviously, it is much more accurate to say that 7 pupils spelled no words correctly, 14 spelled one word correctly, etc. (Table I), than to say that 60 pupils spelled from 0 to 5 words correctly (Table II). On the other hand, it is desirable that the number of classes be small enough to afford a generalized or typical result. A good rule to follow is: arrange the data in as many classes as will secure the greatest regularity of frequencies, *i. e.*, in accordance with which the frequencies will as nearly as possible increase to a maximum near the middle of the range, and then decrease to a corresponding minimum. While the number of classes in Table I, according to this criterion, is too large, it might not be too large if we had five or six thousand measures.

The graphic representation of the frequency table is called a *frequency surface* or *frequency polygon*. Figure 1 is a frequency

¹There is a slight irregularity in the class intervals in that the first class contains six units.

surface corresponding to Table II. Observe that the measures, grouped by classes, are arranged along the base line. The height of each column erected above a given class corresponds to the frequency of the measures for that class. These frequencies may be read from the vertical scale at the left of the figure.

In Figure 1 the columns rise on either side of the tallest column with an approach to regularity. If, instead of 50 words, we had 500, so that we could make 501 classes, and if the number of pupils, (*i. e.*, of measures) were indefinitely increased, the perimeter of Figure 1 would approach the form of a smooth curve having a single peak near the center and sloping toward the base line to the right and left.

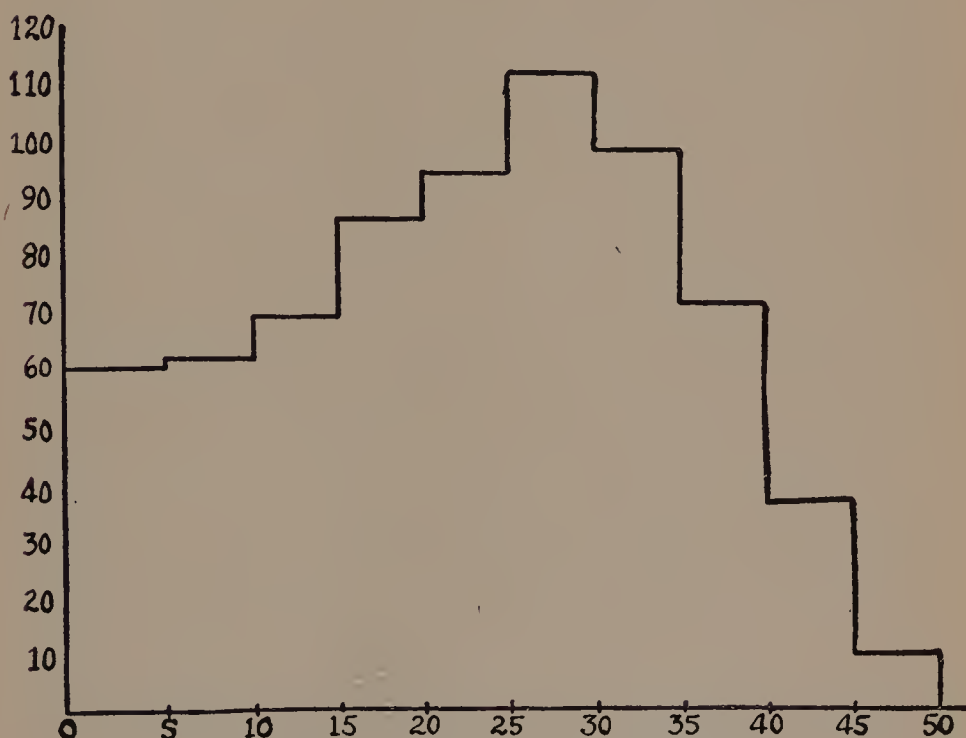


FIGURE 1. Frequency of Correct Spellings

Horizontal distances represent numbers of words correct; vertical distances represent numbers of pupils. Data from Table II.



FIGURE 2. Normal Surface of Frequency

The base line of such a curve is called the *abscissa*. Along it are represented the values of the variable. The perpendiculars from the curve to the *abscissa* are called *ordinates*. They represent the frequencies of the values of the variable. The longest perpendicular is called the *maximum ordinate*, and the measure represented on the *abscissa* at the foot of it is the most frequent one. If a curve is of the symmetrical form shown in Figure 2, the maximum ordinate divides the area between it and the *abscissa* into two equal parts. A curve of this form is variously called the Gaussian curve, the curve of error, the probability integral, or the normal curve of frequency.

If a smooth curve were drawn to fit as closely as possible the frequency surface of Figure 1, this type form (Fig. 2) would not be accurately reproduced. Spelling ability, however, among eighth-grade boys may, nevertheless, be distributed 'normally.' The present state of our knowledge does not permit us to be sure that the words selected would register all abilities among eighth-grade boys. Again, details, not here reproduced, indicate that the number of children was too small to bring out the real distribution. One small school furnished more than half the children who spelled from 0 to 5 words correctly, and more than one-third of those who spelled 0 to 15 words correctly. This unusually low performance causes the first three columns of Figure 1 to be unduly high. The remedy, of course, is to obtain returns from a great many more children.

Although the arrangement of many measures in a frequency table and their graphic representation by a frequency surface permit the mind to grasp the significance of the data far more readily

than is possible without such devices, nevertheless further simplification is generally desirable. The more numerous the measures and classes of measures, the greater is the need for concentrated information—that is, for a single simple expression which shall contain in itself a summary of the whole series. This is the purpose of averages.

The term *average* has both a general and a specific meaning. In its general sense it means any expression intended to give by a single figure, the general weight or typical measure of a series.² In its restricted sense, it refers to the arithmetical mean, *i. e.*, to the sum of the measures divided by the number of them. This is what we generally mean when we speak of *the* average. In educational statistics, the term used to express the general concept of average is *central tendency* (C. T.). As has been stated above, series of educational measurements, when properly derived, tend to exemplify the theory of error, *i. e.* (to state the case very crudely), there is a part of the series where the measures are most numerous, while the other measures become fewer, the more they differ from the most frequent measure. Unless this condition is approximated, it is not appropriate to speak of a 'central tendency.' We may, indeed, make an arithmetical computation. The average of the annual enrolments of an institution which is steadily increasing in size may thus be found and will have its uses, but it will not be typical of any tendency in the measures.

Since we are permitted, however, from the nature of educational data to use the term 'measure of central tendency,' it will be best to use the term 'average' in its commonly accepted sense, as meaning the sum of the measures divided by the number of them. Some writers call this the "arithmetical mean," or simply the "mean."

The three measures of central tendency (C. T.) most frequently used are the average, or arithmetical mean (A), the median (M), and the mode (Z). The median has been defined as the mid-most measure of a series whose measures are arranged in order of size, beginning with the smallest or the largest. According to this definition, the median is the $\frac{N+1}{2}$ th measure (N being the number

²See, for example, Zizek, Franz. *Statistical Averages*.

of measures). There are objections to this conception of the median, and recent workers have defined it as a *point* on the scale on each side of which half the measures lie when they are arranged in order of magnitude. The significance of this definition is that it emphasizes the idea of a *point* on the scale rather than a measure. The measures in Table I are arranged in order of magnitude. Half the number of measures (pupils) is 350. From the beginning through Step 23, there are 342. Eight more measures are needed to complete the 350. These are all contained in Step 24, which may, therefore, be called the "median step." Since the series is to be regarded as continuous, we must seek the M—the "point on the scale on each side of which half the measures lie"—somewhere in Step 24, *i. e.*, between 24 and 25. We now assume that the 14 measures entered at "24" in the table are uniformly distributed between 24 and 25. Since we need 8 of them, M will be 8-14 of the way from 24 towards 25. Hence the M is $24 + 8 \cdot 14$ or 0.57 of the step. The step is 1; therefore the M is 24.57. If we count from the other end of the table, we obtain the same value, thus checking the computation.³

If the data were available only as in Table II, the M would be found to be 24.88, instead of the more correct 24.57, as computed from Table I. Thus, the greater regularity of Table II is gained at the usual sacrifice in accuracy.

Series may have but single measures at each value, and there may be more or less wide gaps in the values. If the number of measures is odd, M is the middle one; if even, it is the average of the two middle measures. For example, if the expenditures per pupil for 35 cities are listed in the order of their amounts, M is the expenditure of the 18th city. If there are 36 cities, M is the average expenditures of the 18th and 19th cities.

The median may be used when the items have been merely ranked, instead of measured. Thus a teacher may arrange the compositions of a class in the order of their merit according to her

³If there were 701 measures made, let us say, by including one pupil who spelled 37 words correctly, we should find the 350.5th measure. We should then need 8.5 of the 14 measures at Step 24, and M would be 24.61.

judgment.⁴ The middle one (or the two middle ones, if there are an even number of them) is the typical performance of the class. Such typical samples may be compared with others similarly obtained at later dates, and thus a showing of the progress of the class may be made. To add to the definiteness of this, the median samples may be measured by a composition scale.

It was pointed out above that the nature of the units in which measures are expressed must be clearly apprehended and consistently adhered to. Failure to do this introduces error in all the results of statistical analysis. An illustration of such an error made in the computation of medians may be found in the report of the Salt Lake City Survey. In the Table (p. 140) showing the distribution of composition scores by grades, failure to take account of the nature of the unit resulted in reporting medians which were too small by an amount greater than the average annual improvement from grade to grade. The teachers rated the compositions according to the original Hillegas scale. The values of the samples on the published scale were 0, 183, 260, 369, 474, 585, 675, 772, 838, and 937. In reporting the ratings of the teachers, however, these values were called respectively 0, 1, 2, 3, 4, etc., and in computing the median these *latter values* were the ones used, and they were called the *mid-points* of their respective class-intervals. Accordingly, when a teacher rated a composition as 3, (really 369) she was regarded as placing it between 2.5 and 3.5. As a matter of fact, she was placing it as nearer to 369 than to 260, or 474, and the class-interval was therefore from 314.5 to 421.5. The median for the 4th grade was found to lie four-tenths of the way into the class called "3" in the table, and, since the lower limit of this class was taken as 2.5 and the interval as 1, the median was reported as 2.9. The lower limit, however, for the class was really 314.5 and the interval 107. This yields a median of 357.3 ($314.5 + 107 \times 0.4$) or, shifting the decimal point for convenience and expressing the result correctly to one decimal place, 3.6, instead of 2.9 as reported.

The mode is the most frequent value in a series. As such it is

⁴This may be done very accurately by making all possible comparisons of two papers and giving the better paper of each pair a preference mark. The paper having the greatest number of preference marks is the best paper; the one having the next greatest is the next best, etc.

the most evident measure of C. T. It is what most people think of when they speak of the average. A teacher, if asked her pupils' average age, will probably reply by giving the most frequent age. The mode, therefore, is peculiarly dependent for its significance, and indeed for its existence, on the structure of a series. There may, indeed, be more than one mode in a series, but in educational work the presence of two or more modes indicates a probable fault in the procedure.

We may distinguish the *empirical mode* and the *theoretical mode*. The former is obtained by inspection. It is taken as the mid-value of the class-interval containing the largest number of measures. It, therefore, depends on the size and position of the classes in the frequency table. This suggests that by varying the size and position of classes we may obtain different values of the mode and by combining them, arrive at a more accurate value of it than is possible with a single determination. This method is described in most of the textbooks.⁵

The theoretical mode is not obtained directly from the data, but is the mode which would result from an indefinitely large number of measurements sub-divided into very minute classes. Its most satisfactory determination is based upon fitting an ideal frequency curve to the actual series. The value of the variable corresponding to the maximum ordinate of the fitted curve is the theoretical mode. Its determination involves some rather advanced work in mathematics, and it is not being used in educational measurements. A substitute for this method has been suggested and is said to work well. According to it

$$\text{Mode} = \text{Average} - 3 (\text{Average} - \text{Median})$$

The average for the series given in Table I is 23.91. The median, as shown above, is 24.57. The formula just cited yields 25.89 as the value of the mode.

When the performance of pupils is recorded in the form of rates, *e. g.*, of words read per second or letters written per minute, a measure of central tendency sometimes used is not the average of the rates, but their *harmonic mean*. This may be defined as the

⁵See Bowley, Arthur L., *The Elements of Statistics*, London, 1907, pp. 118ff.; also King, Wilford I., *The Elements of Statistical Methods*, New York, 1912, pp. 122-125.

reciprocal of the average of the reciprocals of the recorded measures. Suppose five pupils read at the following rates per minute: *A*, 80 words; *B*, 100 words; *C*, 120 words; *D*, 140 words; and *E*, 160 words.⁶ The average of these rates is 120 words per minute. The reciprocal of each rate expresses the *actual time* required by each pupil to read one word. Thus, *A* required $1/80$ min., or 0.0125 min., to read one word; *B*'s time was 0.01 min.; *C*'s, 0.00833 min.; *D*'s, 0.00714 min.; and *E*'s, 0.00625 min. The average of these is 0.00884 min. It shows the average time required to read one word. The reciprocal of this average of reciprocals is $1/0.00884$, or 113—the average number of words read per minute as computed by finding the harmonic mean. Note that we have found the average of the reciprocals of the rates and taken the reciprocal of the result. The average rate by this method is 113 words, while the average by using the rates directly is 120 words. The harmonic mean is always less than the Average. It is, therefore, clear, that results as found by different investigators are only comparable when computed by the same method.

On practical grounds it is difficult to see why we need the harmonic mean as an alternative method in computing the central tendency of rates. There is no essential difference between rates per unit of time and certain economic measures such as wages per day. It is certainly not customary to express the central tendency of the wages of a group of workmen by using the harmonic mean. In the judgment of the writer, the introduction of this method in educational reporting serves no useful purpose.

A measure of C. T., although indispensable, by no means sufficiently represents a series. It gives but one of the two chief characteristics of it. The second of these is the closeness with which the measures group about the C. T. The measure of this characteristic is called the *measure of variability*, or dispersion. There are three such measures in common use, and one of them should be used and reported, not only for its own sake, but also as a criticism of the measure of central tendency. All measures of variability, like those of C. T., are expressed in units of the series. For example, if the units of the series are words spelled, the C. T., as well as the varia-

⁶Gray, William S., *Studies of Elementary-School Reading Through Standardized Tests*. p. 15.

bility, will be expressed as a certain number of words. The *average deviation* (A. D.)—also the mean deviation, or mean variation—is simply the average of the amount by which each of the measures differs from the average, median, or mode. It is being suggested by several writers that on theoretical grounds the A. D. should be computed from the median, because when so computed for any series, it is at a minimum. People in general do not sense the meaning of the A. D. or any other measure of variability as readily as they do a measure of central tendency. The A. D. may be thought of as the amount by which every measure of the series might differ from the C. T. without influencing it.

The *standard deviation* (S. D. or σ) is another measure of variability. It is found by squaring the difference between the individual measures and the C. T., adding these squares, dividing by the number of measures, and extracting the square root of the quotient. The S. D. is theoretically the best measure of variability—at least when the series is 'normal' or nearly so. Its meaning, however, is not apparent to the lay reader, and it is difficult to explain in terms of the series. If, in Figure 2, perpendiculars are drawn from the two points on either side of the maximum ordinate at which the curve changes from concave downward to concave upward, the distance along the base line from the foot of the maximum ordinate to the foot of either perpendicular represents the S. D. Between these perpendiculars a little more than two-thirds of the area of the curve is included. In series, therefore, which approximate the normal type, we may expect about two-thirds of the measures to differ from the C. T. by not more than the standard deviation. The S. D. is at a minimum when computed from the average; and according to the best practice, it is therefore taken from that measure rather than from the median or mode.

The *quartile deviation* (Q) is half the range within which the middle half of the measures lie. In its computation one finds the three points in the range which divide the number of measures into four equal parts. These points are found in exactly the same way as the median. The points on the range at which these divisions fall are called the quartiles. The first, or lower one, is called the lower quartile, or 25-percentile (Q_1); the third or highest one is called the upper quartile, or 75-percentile (Q_3). The second one,

of course, divides the measures into the two equal parts and is the median; it is not, therefore, referred to as a quartile. The difference between the upper and lower quartile is the range within which half the measures lie. This difference divided by 2 is Q. In the case of normal distributions, it is called the *probable error* (P. E.).

It is important that the student of educational statistics should understand not only that A. D., S. D., and Q are measures of variability, but also that they are themselves important units of amount, and that for some purposes they replace the units in which the measures were recorded. Suppose that a group of eighth-grade pupils is tested in arithmetic and in handwriting. If a certain pupil scores 17 examples correct in arithmetic, and Quality 75 in handwriting, according to the Ayres scale, it is impossible to say how much the one performance is better than the other, unless both performances are expressed as a certain number of A. D's, S. D's, or Q's above or below the median of the group. Either of these units will serve to express the measures of a series in such a way as to permit comparison with the measures of another series expressed in the same units of variability, even though the original units of the two series are different.

If it is desired to compare the variabilities of two different series, we can hardly do so by using either of the three measures described above. If, for example, a group of children is rated in composition by the Nassau County Supplement to the Hillegas Scale, and in spelling by means of a list of 100 words, since the possible range of achievement in composition is only from 0 to 9, while in spelling it is from 0 to 100, the variability in the latter case will appear to be much greater than in the former. Under such circumstances, it is customary to divide the measure of variability by the C. T., the result being the so-called *coefficient of variation*. Generally speaking, it is an error in method to compare the measures of variability of two series unless the series are expressed in the same units and have approximately the same C. T.

Although the analysis of series may be carried to higher degrees of refinement, educational workers report few measures other than those of central tendency and variability. No small space, however, in educational literature is devoted to the determination of the degree of *correlation*, or mutual implication, existing between

paired measures of different traits or performances. Thus, if 100 high-school children are rated in Latin and in algebra, the extent to which an individual having high, medium, or low ratings in one subject tends also to have high, medium, or low ratings in the other, indicates the correlation for the group in question between ratings in Latin and ratings in algebra. Various methods have been devised for giving numerical expression to this correlation between two series of paired measures. Two of the methods suggested by Spearman—the “Rank Difference” and the “Footrule”—depend on the extent to which the individuals ranking first, second, third, etc., in one series tend also to rank in the same order in the other. Such a correspondence in ranking would indicate perfect correlation, and would be expressed by the integer 1. By another method (suggested by Sheppard) each measure in the two series is given a sign plus or minus, according as it is greater than or less than the central tendency, and the number of times a plus or a minus sign in one series goes with the same sign in the other series for the same individual is noted. The greater the proportion of “like-signed pairs,” the greater is the correlation. The formula which is used in connection with this method again yields “1” as the measure of perfect correlation, *i. e.*, as the measure obtained when all the pairs of signs are alike.

Still other methods are used, but the so-called product-moment method is the one most commonly accepted. The meaning of the formula used in applying this method cannot be made clear in a brief description. The reader is referred to any textbook on statistics for a treatment of it. The measure of correlation yielded by this method is called the *correlation coefficient*, and its symbol is “*r*.” To such an extent is the product-moment method, the standard in statistical work that coefficients derived by other methods are usually converted into it.

In determining the degree of correlation which subsists in a given group with respect to two measurable characteristics, it must be emphasized that the individual measures, pair by pair, are to be used. It is not correct procedure to break the group up into smaller sub-groups and to compare the averages in the two characteristics for each group. Averages obscure individual variations

and it is precisely the individual variations which are important in securing a correlation coefficient.

The correlation coefficient as an expression of relationship has been uncritically adopted. It is a measure of mutual implication. It fails to indicate the extent to which either of the measured characteristics depends upon the other. It may, however, be used in finding other expressions which do so. Thus, statisticians, while becoming more critical of the correlation coefficient, are using it to determine the two so-called *regression coefficients*, which permit a statement of the change in one characteristic likely to accompany a unit change in the other. I found, for example, that the correlation coefficient between achievement in answering thought and memory questions in history was $+0.40$. This was not nearly so informing as were the regression coefficients, one of which showed that success in answering thought questions accompanied success in answering memory questions to the extent of nearly 0.90 —"1" being the maximum. The other regression coefficient, *i. e.*, of 'memory' on 'thought,' was less than 0.20 .

Most of the foregoing statements, and many others not made here, depend to a large degree for their validity upon the existence of 'normal' distributions. Although the ability of school children in a given grade is presumably close to normal, measurements obtained from test material often fail to support the presumption. Aside from the fact that the pupils 'measured' are often relatively few and poorly selected, and that results are frequently scored by interested or indifferent persons, there is another important reason for this—a reason which has to do with the test itself as a measuring device.

It is necessary, in the first place, to understand clearly what it is that we are measuring when we test school children. Mr. Courtis has pointed out a useful distinction between capacity, ability, and performance.⁷ *Capacity*, as he defines it, represents the possibility of development—the natural endowment of the individual. It is his potential ability, and is independent of training. The *ability* of an individual is defined as the power actually developed by the effect of training upon inherent capacity. *Performance* is the spe-

⁷Courtis, S. A., *Third, Fourth, and Fifth Annual Accountings, 1913-1916.*

cific achievement of an individual resulting from his ability as evinced under the conditions of the test.

Although we may have good reason for supposing that the distribution of school ability is closely similar to the normal distribution, we see in the distinction which has just been made, that what we are really measuring is not ability, but *performance*, and that while ability may be constant at any particular time, performance will vary according to the conditions under which the ability manifests itself. This constitutes a real difficulty in educational measurements, especially when conclusions are drawn concerning individuals rather than groups of individuals. It has been proposed that as many as twenty-five tests of a single individual ought to be made and the average of the results used before we can be reasonably certain that we have a reliable measure of performance. This is an extreme point of view and seems hardly to be tenable. Courtis has shown that if children are given a second test, only about 20 percent of them will show marked differences in performance. He has also shown that giving additional tests does not materially change the score for a class as a whole.

Since, however, what we are measuring is performance rather than ability, our tests must be so constructed that performance will tend to vary with ability, *i. e.*, to be an index of it. Thus, the conformity of the resulting measures to a normal distribution furnishes a criterion for judgment as to the adequacy of the test material. Assuming that ability is distributed approximately normally, it is highly desirable that the test material should be such as to bring out that form of distribution. Too often this is not the case. On this ground a great deal of test material now being used in education is faulty. For example, most of the testing which has been done in spelling by using Dr. Ayres' list has resulted in a large number of perfect papers, or papers that were nearly perfect. This is because the examiner has chosen words which Dr. Ayres found possessed little difficulty for the grade in question. Recently, results were published from the use of words, each of which, according to Dr. Ayres' list, had been spelled correctly by 88 percent of the children. Naturally, a very great number of the children spelled all the words correctly. Under such circumstances, no measure of central tendency could be regarded as significant. In the

fourth grade, 15 percent of the children wrote perfect papers. More of them spelled all the words right than spelled any other number of them. The test material was too easy to register variation in performance among the more capable children and therefore failed to afford any index of their ability. It is certain that among the children who spelled all the words correctly there was a wide difference in ability which would have caused a correspondingly wide difference in performance, if the material had been capable of showing it. The same inadequacy of test material is revealed when it is too difficult for the pupils to whom it is presented. Under such circumstances a large number of children of varying degrees of ability will be unable to register any performance in terms of the test. For example, in a certain test in arithmetic 145 children out of 943 were reported as unable to solve a single problem. Among these children large differences in performance corresponding to large differences in ability would have been indicated by a different test, *i. e.*, by one easy enough to enable them to accomplish something.

The best test material will be found to be midway between that which, through being too easy, fails to register variation among the pupils of greatest ability, and that which, through being too difficult, fails to register variation among those of least ability. A spelling test, for example, composed of words, each of which may be expected to be spelled correctly by 50 percent of the children in the grade taking the test, will afford ideal results. In general, test material is most adequate which yields a series of measures with an approximately normal distribution. Any piling up of measures at either the high end or the low end of the range is a defect. Such material is impossible when given to pupils in several successive grades. In the writer's judgment, no test is satisfactory when used in grades more than two years apart.

Various types of tests are being used to measure educational products in terms of the performance of children. Dr. Ayres has distinguished three. First, there are those in which the material is arranged by steps of increasing difficulty from very easy to very hard, such as Gray's Oral Reading Scale, and Woody's Arithmetic Scale. These may be called *difficulty tests*. They measure "how hard." Second, we have *accuracy tests*, or those which measure "how well." Examples of these tests are the various reading tests

which measure the quality of reading by the accuracy of the reproduction of it. Third, we have tests in which the material is intended to be of the same difficulty throughout, and in which the pupil is required to do as much work as he can in a given time. This kind of test may properly be called a *speed* or *rate test*. It measures "how much." Doubtless we should measure performance by all three of these devices. Ultimately we shall have *at each point of difficulty* as set up in the first type of tests, a large number of elements—words, problems, passages to read—each of the same difficulty. The arithmetic tests used in the Cleveland Survey are an approach to this. The criticism of the difficulty tests which have a single element at each step is that the difficulties of the elements are of different kinds. The criticism of the accuracy and rate tests is the varying difficulty of their elements. If, however, we have a large number of elements at each level of difficulty, we may then apply the kind of measurement used in the second and third types of tests, and, *within the difficulty in question*, we may measure both "how well" and "how much." Under such circumstances, our record of performance would, so to speak, consist of three dimensions. It would also afford a better index of *ability*.

Meanwhile, many new tests are needed, as well as much refinement of the material of tests now in use. It is unnecessary at this time to decide the relative merits of difficulty, accuracy, and rate tests. At present, the best criterion to apply to these types of tests is that of the regularity of the series of measures derived from them. If we are warranted, as it seems we are, in inferring that ability is distributed with an approximation to normality, then the highest requirement on the part of a test is that it measure performance in such a way as to be a true index of ability. The conditions under which tests are administered and the methods by which they are rated must be rigorously controlled, but the first requirement is that the means of measurement should be sensitive instruments, capable of registering variation in the things which they presume to measure. We may labor ingeniously at our analyses of results and may bring from afar the most potent methods which statistical theory has evolved, but we shall accomplish little if our instruments are as grossly defective as some of those which are now being employed appear to be.

CHAPTER X

TRAINING COURSES IN EDUCATIONAL MEASUREMENT

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The rapid growth of the movement for measurement and the importance of the knowledge gained from surveys and experimental studies have led to a demand for definite training in measurement work. From superintendent to teachers, educational workers have been quick to recognize both the possibilities of the new tools and their own need for training. Wherever courses in measurement have been offered, the response has been surprisingly large. As a result the number of courses available in colleges and universities is steadily increasing and their influence is spreading to other fields. There are few teachers' institutes which do not touch upon some phase of measurement work, and few normal schools or other teacher training agencies which are not beginning to arrange for systematic instruction along these lines. At present there is, as might be expected, almost no agreement as to the aim or method. The courses range from the shallowest survey of the literature of the field, to the most highly technical and theoretical courses of university psychology. It may not be out of place, therefore, to give some account of the needs of teachers as seen by one who has served for several years as director of research in a large city school system.

The primary aim of all courses for teachers must be to increase the teaching power of the students. But teachers are the stuff from which principals, supervisors, and superintendents are made, so the training courses must be both broad enough, and wide and deep enough to give some knowledge of the administrative and supervisory uses of tests as well as of their instructional and diagnostic functions. For most teachers, practically the only opportunity to consider the workings of the school system *as a whole* and to think about educational problems from the supervisory and administrative standpoints is that which comes to them during the period

of training. Therefore, while the measurement work in a normal school should center around the direct application of measurement to the solution of problems of teaching, the broader aspects of the results secured must not be overlooked.

The desirable outcomes of courses in measurement, as of other instructional work, are of four different types—(1) point of view, (2) knowledge, (3) skills, (4) power. Each of these will be discussed in turn.

1. Of all the possible outcomes of training work in measurement, none is so important as the effect upon the student's *point of view*—upon his attitude, not only towards scientific experimentation in education, but also towards his educational experiences and life. For, too often, normal-school courses result merely in giving the prospective teacher the idea that everything in education is settled. A textbook is necessarily dogmatic in statement. Courses in methods and teachers in charge of training necessarily tend to stamp this as right and that as wrong. The training period is altogether too brief to do more than outline existing ideals and practices, and indicate those that are “the best.” Even practice teaching under expert guidance usually serves but to give practical experience in “handling a room” and in conforming to teaching routine. Occasionally, a student of exceptional intelligence senses the contrast between ideals and existing conditions, but even his experiences seldom stir more than questionings and dull resentment.

Teaching, itself, is even more deadening to initiative. In all systems of any size the courses of study, and often the method to be used, are fixed by higher powers. The equipment, the time allowances, the size of classes, the types and abilities of the children, are all beyond the teacher's control. What is there in the training or experience of the average teacher to develop openness of mind, or give any conception of our present educational process as a crude, inefficient, wasteful makeshift, established “by guess and by gosh,” and maintained by convention and social inertia?

Therefore, it should be the supreme function of measurement courses in normal training—as it has proved to be in the educational activities in the world outside the school—to give the student

the scientific attitude of mind, the critical, impersonal, and inquiring point of view. They must teach him how knowledge arises and make him feel the cost in time and labor by which the present levels of civilization have been attained. They should so clearly reveal the part that measurements and scientific methods have played in every field of human activity that he will realize their importance in education and desire to make himself proficient in their use. They must give him bases of criticism and arouse in him such a passion for truth that all his life long he will constantly seek to test, open-mindedly, disinterestedly, impersonally, the validity of all conclusions. They should lead him to regard all educational activities as problems in course of experimental solution, so that he will be ever on the watch for those significant variations which make for progress. Above all, they must so open his eyes to the wonders of the educational process, the possibilities of child development, and the relation of progress in education to progress of the world that he may have an abiding faith in the dignity and value of his profession and a burning zeal to make some contribution to the progress of the race. If the courses do this, they will be counted successful long after all technical knowledge and skill has been forgotten; if they do not, they are failures, although their graduates know every test by name and are past masters in the art of compiling tables and graphs.

2. On the side of *knowledge* there is much to be learned. The student must acquire by actual experience, knowledge of the different types of tests and the advantages and limitations of each. He must be familiar with the methods of test and scale construction and must have a first-hand experience in giving and scoring the more important of the available standard tests. He needs to know where to go for standards and comparative data, and he should have made a careful, critical study of two or three typical survey reports. He must be given, also, some experience with the variations in performance caused by changes in conditions and must learn how these are to be controlled and interpreted. More than anything else, his practical work must serve to emphasize the difference in individual children and the need of adjustment of training to such differences.

It is not enough, however, that the teacher in training have a practical working knowledge of educational tests; he must know also tests in related fields. He should be given more than a passing acquaintance with physical measurements—height, weight, lung capacity, and their significance, and simple tests of vision and hearing. He needs also some knowledge of the methods and tests employed in measuring intelligence and capacity. Further, he needs practice in the construction of rough tests and examinations, and the formulation of aims in terms of objective standards. Knowledge that is only knowledge, is vain. If the knowledge outlined above is merely memory of things read or transmitted by word of mouth, it will be of little worth. It should be knowledge derived from personal experiences.

3. The other product of experience is *skill*, and the successful course in educational measurement will have as one of its outcomes, the ability to pass certain standard tests in statistical methods; for instance, rate tests in making typical distributions, in finding averages and medians, in computing median and standard deviations, in calculating coefficients of correlations, and in drawing graphs. Even more important than these are standard tests of ability to use educational scales in a consistent manner. There should be training on some of the standardized samples which have been published in writing and composition, until a set of 20 test samples can be marked without a variation of more than half a step of the scale.

Only as the course results in a measurable proficiency in these fundamental skills should it be counted successful. Not all persons have the mental qualifications that make possible accurate judgment by means of a scale, and not all have the aptitude for statistical work; but all teachers, without exception, *need to have measured themselves against such objective standards*, both that they may know their own powers or limitations, and that they may understand the method and aims of those who have the measurement work in charge. The greatest obstacle to harmonious, cooperative work in a city school system is the misunderstanding of those who, through ignorance, misinterpret the aims of the measurement work.

4. Finally, the successful courses in measurement should result in *power* to use measurement in the solution of educational

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problems. That is, for full credit, the student should be able to pass successfully three types of power tests; (1) he should have planned, measured, and compared the effects of his own and another's teaching of a specific instruction unit, like the teaching of a given twenty words in spelling, or a certain case in long division; (2) he should have devised, executed and interpreted a simple control experiment to settle some problem arising out of his practice teaching; (3) he should be able to diagnose by means of appropriate tests, and to prescribe the remedy for, the more common causes of failure in the fundamental subjects. No teacher who has had the practical experience with tests and testing that will enable him to meet these requirements will ever be willing to teach without the aid which standard tests afford.

There are five major articles in the writer's educational creed:

1. Basic experiences cannot be transmitted by instruction.
2. Understanding of the value of tools is best learned by their use as a *means to an end*.
3. Skill in the use of tools is best developed through drill.
4. Outcomes related to self-interest have greater educational potency than abstract aims.
5. All training work must be adjusted to the varying capacities and interests of individual students.

Expressed in terms of method of teaching a course in measurement these mean:

1. That the work must be "practical" in character.
2. That it must center around, and have for its purpose, the measurement, and improvement, of the practice teaching.
3. That it must consist mainly of laboratory work with only as much lecture work and reading as is necessary to connect the activities of the course with similar activities in the school system and in the educational world outside.
4. That it should consist of a series of graded exercises or projects grouped around the main topics in such a way as to provide for individual progress and differences in interest.

It seems futile to attempt to give more specifically a statement of precise topics covered, or the length of the course in terms of years or hours. Adjustment must everywhere be made to local conditions. But the material available and its importance warrants

the prophecy that in a very short time the work in measurement will be a major subject running through the entire period of training. For a six semester course (four semesters in school and two actual teaching under supervision), the following might serve as a general program. For shorter courses, the actual amount of work done would be correspondingly decreased.

Semester I. General principles of measurement, including physical and mental tests, and elements of statistical methods, with special emphasis on individual differences, the factors causing variation, and the need for control of conditions.

Semester II. Use of the simpler standard tests in measuring the effects of practice teaching.

Semester III. Measurement by means of the more complex tests, with special emphasis upon correlation of abilities and analysis of complex ability into simple elements.

Semester IV. Measurement of the results of educational experiments and of the effect of remedial work with individual children. Emphasis on the diagnostic and supervisory uses of tests, both for individuals and for a school system as a whole. Class assignments mainly individual projects, or actual participation in surveys and other practical testing work.

Semesters V and VI. Period of probationary teaching. Reports to supervisory officers to be based on the use of standard tests of the results of teaching effort.

An appropriate conclusion to this chapter is a comment on that anomaly—a course on educational measurement in which no use of measurement is made, either as a basis of adjusting the work to the abilities of individual members of the class, or as a means of measuring the efficiency of instruction. As long as educational training concerns itself with superficial conformity to conventional practices and hasty surveys of educational literature, little in the way of progress can be expected. But if the work in the training and practice schools is actually the most efficient in the system, and if there, the teacher-in-training learns to see problems as problems, and to attack them with the best tools and methods, the training which he receives will function all through his professional life. Probably upon the character and practical value of the instructions given to prospective teachers, more than upon any other one factor, depends the success of the movement for measurement and the character of its future development.

CHAPTER XI

SUGGESTIONS FOR EXPERIMENTAL WORK

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EMPIRICISM AND SCIENCE IN EDUCATION

The United States has no national system of education. Each state, each municipality, each school district plans its own course of study, determines its own school organization, supervises its own school work, chooses its own plan of procedure, establishes its own standards. Our nation is called "the world's greatest experiment in democracy." With equal truth it could be called "the world's greatest experiment station in education." All kinds of educational problems are being attacked experimentally—problems in the administration, the supervision, the teaching and the financing of schools. All varieties of curricula are involved, all kinds of school equipment and appliances, and every conceivable method of teaching the various subjects.

Many communities believe that their methods of school procedure are the best. Yet they are wholly without scientific evidence in support of their belief. Thus it is often easy for an enthusiastic devotee of some new method of procedure to influence the agencies of control to such an extent that an entire school organization is revolutionized. Witness the change of a large number of elementary schools in New York City to the Gary plan of organization. We are not arguing that New York City has not improved her schools by the change; for we do not know whether she has or not. New York City does not know. No one knows. The Gary System may have many valuable contributions to make to education. The point is that the plan is new and has not been in operation long enough to have demonstrated its superiority over the conventional

school organization. Yet, in spite of that fact, the Gary system has been and is being enthusiastically copied not only in New York City but in many other communities as well. In like manner, countless other changes in school organization and school procedure are being made year after year on the basis of plausible arguments; and no one is able to demonstrate the wisdom of the change. In many cases a few years later the school returns to its original plan. Witness the more recent action at New York in abandoning the Gary plan after spending several million dollars in introducing it. Could industrial establishments succeed by such methods?

School authorities are constantly changing methods of procedure, and courses of study. This harasses teachers, annoys parents, lowers the efficiency of work, and destroys the confidence of the public in its school system. Such arbitrary orders are based merely on the personal opinions of those in authority. Even up to the present time, almost every school policy has been adopted on insufficient evidence or upon no evidence at all. In other words, personal opinion decides the destinies of school children and determines school curricula and school organization. Scientific methods have been recently introduced into industrial work, business, agriculture, and many other forms of human activity. Even the church is having its methods subjected to rigorous criticism from the standpoint of efficiency. In the management of the war, we see great nations struggling to apply every known scientific principle. Certainly education, the most important of human industries, cannot afford to neglect any opportunity to test scientifically its methods of procedure and to demonstrate the value of its results.

In this chapter I am to make a few practical suggestions that may be helpful to the teacher, principal, supervisor, or superintendent who desires to contribute his "bit" to educational progress. These suggestions will be valueless to the persons who still believe that we can measure achievements in school work by the personal opinion—frequently the offhand and prejudiced opinion—of some one individual. We know that improvement in all human activities depends very largely upon critical studies of existing conditions and upon the establishment thereby of standards to be attained at each

stage in the development of these activities. It is evident that progress in education is dependent upon a similar process. The inability of school administrators in the past to make reliable measurements has greatly retarded progress. It is true that they have been able to measure such facts as *per capita* costs, numbers and ages of graduates, the percentages of retardation, etc. Helpful as such measurements are, they fail to yield the information upon which an adequate appraisal may be based. The recent development of means of measurement, however, permits true educational experimentation.

METHOD OF COMPARISON

In order to determine progress in any phase of school work, one must first analyze the situation to discover, as far as possible, the various factors that enter into it. These factors must then be studied singly and the effect of each determined. It is the analysis of these complex situations and the study of each of their factors that renders educational measurement so difficult. This is especially true in attempting to compare the efficiency of different methods of school supervision, organization, or administration.

It is probable that experimental work can render its greatest service by being applied to a study of methods of teaching and of the organization of subject matter. These problems are constantly before superintendents of schools and one or more of them can be selected each year for special study. The mere fact that they are being studied will have a beneficial effect upon the school system.

As we do not have standards in all school subjects, it is necessary to employ many other means of measuring school achievements. One device, concerning which a few suggestions will now be offered, is the 'Control Experiment.' In order that the conclusions from a control experiment may be of value, a careful plan of procedure must be followed.

First. Analyze your situation and select one factor to be studied.

Second. Select two groups of pupils approximately equal in number, in ability, and in previous training. Each group may consist of one, two, three, or more classes.

Third. At the beginning of the experiment, carefully measure the ability of each pupil in the factor under consideration.

Fourth. Select teachers who are open-minded. If possible, select those who know something of scientific methods. Especially select those who are willing to cooperate and who appreciate the value of following directions. The teachers should be as nearly equal as possible in teaching ability.

Fifth. Prepare carefully detailed instructions for all teachers who are participating in the experiment.

Sixth. Except for the one factor that is being studied, keep all the conditions in the two groups as nearly equal as possible during the progress of the experiment.

Seventh. Continue the experiment long enough for material changes to be made—several weeks, half a year, or even more may be necessary.

Eighth. At the conclusion of the experiment, carefully measure the ability of the pupils in the factor under consideration.

Ninth. Base conclusions as to relative efficiencies upon a study of gains and losses of only those pupils who were present throughout the period of the experiment.

Tenth. Allow for the effects of any varying factor other than the one under consideration.

Eleventh. Avoid conclusions from insufficient data.

Twelfth. Record and preserve the details of the procedure. It may prove to be desirable to check the conclusions by repeating the experiment.

EXPLANATION OF STEPS IN PLAN

First. School results are complexes. Many factors usually contribute to a single result. In a control experiment only one factor should be varied and studied in order to determine the effect of that factor; as, for example, the proper distribution of time in teaching penmanship. Assume that sixty minutes a week may be devoted to the teaching of penmanship in the fifth grade. The following question arises: "Shall this time be divided into five 12-minute periods a week, four 15-minute periods, three 20-minute periods, or two 30-minute periods?" An experiment designed to

answer such a question should provide for four groups of fifth-grade pupils, each working with one of the suggested distributions of the 60 minutes per week to be devoted to penmanship. It may be that a different distribution of time would be advisable in other grades. Hence, similar questions remain to be answered for grades below and above the fifth.

A second question and one entirely different from the one above is, "What is the number of minutes a week in each grade that secures best results in the teaching of penmanship?" Note that this is an entirely different question from the first and cannot be studied at the same time without confusion of results.

Still a third problem: "To what extent can progress in writing be secured without regular drill periods in the various grades?" This problem involves entirely different elements from the first and second problems and cannot be studied in connection with them. One factor only in a situation can be successfully studied at a time.

A pupil's ability in any subject is not a single general ability but the resultant of several special abilities. For example, in arithmetic there are an almost unlimited number of abilities, as ability in adding long columns, short columns, small numbers, large numbers, etc., different abilities in subtracting, multiplying and dividing whole numbers; different abilities in operations in fractions, as in adding, subtracting, multiplying, dividing, reducing, etc. A given control experiment can deal with only a single ability or a single factor in a situation. The science of education will be perfected by solving correctly the numerous small problems involved in the educative process, as successful manufacturing is perfected by handling correctly each detail of its work.¹

Second. In the type experiments to which I have referred in the preceding paragraph, the number of pupils is not large. Larger numbers of pupils add to the reliability of the results, although they make more difficult the control of all the factors involved and the maintenance of constant or standard conditions.

¹The reader is referred to the January, 1912, number of the *Teachers College Record* for a detailed study of the "Separate" and "Together" methods of teaching homonyms. Here there is a splendid illustration of a well-organized and a well-conducted control experiment. The *Teachers College Record* for September, 1913, has another good example of a control experiment on the question of "Formal English Grammar as a Discipline."

Moreover, when the number of pupils is large, the handling of the statistical work becomes very laborious. Accordingly, more trustworthy results may often be secured by the repetition of the experiment in other school systems under standardized conditions.

The groups should be equal in ability because groups having low initial scores usually make large numerical gains with less expenditure of effort than do groups having high initial scores. When equal gains are expressed as percentages they seem much greater when based on low initial scores than when based on high initial scores. Percentage comparisons based upon unequal initial scores are thus very deceptive. Suppose that one fifth-grade group has an average initial speed of 50 letters a minute and the other of 75 letters a minute. An average gain of 10 letters a minute in each group appears to be an equal gain; but when expressed in percentage form it is 20 percent for the slow group and $13\frac{1}{3}$ percent for the rapid group. Thus the slow group has the higher percentage of gain. Yet anyone at all familiar with the teaching and learning processes in school knows that a gain of 10 letters in the rapid group is a much greater achievement than is a gain of 10 letters in the slow group. Hence the importance of having the groups of equal initial ability in order to estimate rightly the improvement. It is well that the sex distribution in the groups be equal and that the previous training and home environment be as nearly equal as possible. Especially is this equality important when small groups are used. If several classes, selected at random, are used in each group, variations in conditions in the different classes will tend to neutralize each other.

Third. In measuring the skill or ability of pupils, care must be taken that the tests measure the ability that is being studied, and that they are given under uniform conditions. No detail is too trivial to be considered. For example, a principal who was giving a test in arithmetic found a room in disorder because it was temporarily in charge of a substitute who was poor in discipline. Before giving the test he administered a sharp reproof to the pupils. Already in a bad attitude, they were humiliated by the reproof and failed to respond properly to the test. An equivalent one, given a few days later in the same room, secured far better results. Not only

must directions be followed exactly, and uniformity of procedure be maintained in all rooms, but also the proper attitude of pupils must be secured. Note in Dr Briggs' study on "Formal Grammar" that he administered the test to both groups at the same time, thus insuring uniformity.

In almost every measurement of school achievement, both quantity and quality must be considered. Thus in handwriting we measure both the rate and the quality of the writing. The customary directions for a handwriting test are: "Write as well as you can at your usual rate of speed the following sentence. Write the sentence again and again until I say 'Stop'." Suppose the teacher adds as a final suggestion, "Now, do your *best*, children"; the rate will then generally be reduced materially and the quality improved only slightly. In one room this added suggestion reduced the usual speed nearly fifty percent. From these comments it is evident that the results would be more trustworthy if the same person gave both the initial and final tests. In measuring school achievements, group measurements are usually taken, since forty pupils can be tested in a group in about one-fortieth of the time required to test each pupil individually. In some cases, as in oral reading, individual tests are necessary. Usually the amount of time required to give individual tests limits such tests to a very small number of pupils.

In testing *groups* the time-limit method is generally used; that is, rate or speed is measured by the amount of work done in a given time. In such tests, absolute uniformity of time is essential. For keeping time, a stop-watch is desirable, or at least a watch with a second hand.

When *individuals* are tested, the work-limit method may be used. According to this method each pupil is given the same amount of work and his performance is measured by the time required to do it. Individual testing by the work-limit method is doubtless preferable to group testing by the time-limit method, but it is seldom practicable in ordinary classroom work.

Fourth. The preceding paragraphs indicate the wisdom of the directions with regard to teachers. Unless teachers are open-minded, they will vitiate results. A teacher who feels that she must prove

that the method or book that she is using is superior to the other method or book will unconsciously destroy uniformity of conditions. Unless teachers have a scientific attitude, they will fail to appreciate the value of many of the requirements in the experiment and are likely to feel that a failure to get highly satisfactory results is a reflection upon them rather than upon the method. To maintain their own reputations as teachers, they must make the method successful. In order to do this they prevent the standardizing of conditions. Unless teachers follow directions conclusions will be worthless.

Fifth. In addition to the detailed instructions in the hands of the teachers, conferences with them are also desirable.

Sixth. As far as possible, all factors except the one under consideration should be kept uniform or standardized for all groups. For example, in the suggested study on "Time Distribution in Teaching Handwriting," no home study or practice on handwriting outside of school should be allowed, for such practice cannot be made uniform. No attention should be given to handwriting in other subjects, otherwise varying factors will be introduced; all practice in and teaching of handwriting should be done during the sixty minutes a week. All other work should be as nearly identical as possible. In the period between the initial and final testing, the quality of the teaching of the different groups should be, as nearly as possible, the same. It is difficult to select teachers of equal ability; but by alternating them, or by repeating the entire experiment with similar alternation, the desired result may be secured. Sometimes the same teacher may instruct the several groups at different times.

Seventh. The amount of time required for a control experiment varies with the nature of the experiment. A few weeks may be sufficient to show differences in improvement in spelling or handwriting. Several months, a year, or even more, may be needed to permit a fair estimate of the value of two methods in reading, or the value of kindergarten work.

Eighth. The same care in measuring the ability of pupils at the end of the experiment must be used as was used at the beginning. The final test must be carefully chosen and must be of the

same difficulty as the initial test. The opportunity for each group to prepare for this final test should be absolutely equivalent except as to the one factor under survey.

In a general study of the school achievements in a system, it is easy to be deceived by two measures taken at different times. Suppose, for example, that you test pupils in spelling in October, using words from the Ayres' Scale. Suppose also that the teachers of your school have not had access to the Ayres' Scale prior to this time, but that after the test each teacher has a copy of it and drills on the words. Even though at the close of the experimental period you do not use the same words as in the first test, but select from the Ayres' Scale other words of equal difficulty, it is probable that your children will have apparently made great gain. You will not, however, have measured the real gain in spelling ability, since the pupils have been specially prepared for the second test.

Ninth. The scoring of results must be absolutely uniform and the tabulations made in the same way. The greatest uniformity is secured by having the same person do all the scoring and tabulating. If more than one person participates in this work, specific directions must be given to insure uniformity of work. The analysis and the correct interpretation of the gains and losses in a control experiment are the most important parts of the work. The value of a method or of a given material is measured by the gain which results from its use. The method of computing this gain will depend somewhat upon the character of the factor that is being studied. In general, in measuring school achievements, the median, as a group measure, has the advantage over other measures. It is easily and quickly computed and is not unduly affected by extreme scores. These extreme scores are always under suspicion. Furthermore, especially high or especially low individual scores have little scientific value in determining, let us say, the efficiency of a method of teaching, since what is done by the unusual pupil does not measure the value of the method for the great mass of pupils. Very high scores or very low scores affect the average much more than they do the median. The median, moreover, is likely to represent more closely the central tendency. It is often desirable to compute from the medians the percentage of gain or loss. When, however, the

percentage of gain or loss *for each pupil* is reported, the figures are misleading, unless the bases (*i. e.*, the initial scores) on which the percentages are computed are equal. Besides medians and percentages, the distribution of the scores (the frequency of each score) must receive careful consideration. The amount and percentage of gain or loss for all pupils having the same initial score are valid figures. The measure of the variability of the gains is likewise important.²

Tenth. After every reasonable effort has been made to keep the factors uniform during the experiment, varying factors will often enter. These must always have consideration and their probable effects must be estimated.

Eleventh. A single experiment, even when carefully conducted, is often not conclusive. In the report on the 'separate' and 'together' methods of teaching homonyms, to which reference was made above, note how guarded Dr. Pearson is in his statements. So far as his experiment is concerned, certain things are true. Another experiment might show different results.

Twelfth. When any conclusion of educational value has been reached by a single experiment, it should always be possible to verify the result by repeating the experiment at another time or in another school under the *same standardized* conditions. This can be done only when a careful record has been kept of the plan of procedure and of the important controlling factors in the experiment.

USES OF CONTROL EXPERIMENTS

Some of the uses of control experiments have been suggested in the preceding discussion. While these uses are various, the following may be particularly mentioned:

- a. To determine the relative value of two methods of teaching.
- b. To determine the relative value of two books or two kinds of drill material.
- c. To determine the best distribution of a given teaching time.

²For statistical methods see Thorndike's *Introduction to Mental and Social Measurements*, Science Press, New York; Whipple's *Manual of Mental and Physical Tests*, Warwick and York, Baltimore, and Rugg's *Statistical Methods Applied to Education*, Houghton and Mifflin and Company.

d. To determine the amount of time needed to secure optimal results in a given subject.

e. To determine the relative value of different organizations of subject matter.

f. To determine the size of classes that will secure optimal results.

g. To compare two types of school organization.

Possibly these last two are too complicated to handle as an ordinary control experiment, but the principles of a control experiment should be applied.

A control experiment is simple, but requires a scientific attitude and the constant use of good judgment and common sense. Many experiments of great promise have been rendered valueless by the neglect of one or two minor details. It will be a great boon to education when the various experiments that are being made in its field are placed under sufficiently controlled conditions to render the conclusions of scientific value.

LARGE PROBLEMS

In addition to the simpler problems suggested above, there are many others which are too comprehensive for any school district or even for any state to solve alone, and which must, therefore, be solved, if at all, by the cooperation of many agencies. Investigations concerning types of school organization, length of sessions, sizes of classes, evening schools, recreation in and outside of school, vocational education and guidance, training of teachers, etc., are of too general a character to be satisfactorily made by a single agency. Various organizations are working on certain of these problems. Among them are the following:

A. The National Society for the Study of Education.

B. The National Education Association.

C. The National Association of Directors of Educational Research.

D. The American Association for the Advancement of Science.

E. Various national organizations for teachers and workers in a number of fields.

F. Departments of education in universities and normal schools. (Some of these institutions have organized cooperative bureaus as described in another chapter of this Yearbook.)

G. State departments, some of which have cooperative bureaus similar to those in universities and normal schools.

H. Educational Foundations.

I. United States Bureau of Education.

The United States Bureau of Education should have a Division of Educational Standards and Measurements. This bureau should be in charge of a thoroughly trained scientific student of education, seasoned by practical and successful school experience, and should become a national clearing house for educational experiment. Several lines of work are open to such a bureau.

First. Testing of Methods. Two methods of teaching could be tried in a score or more of rooms in each of one hundred cities. The United States Division of Standards and Measurements could prepare outlines of experiments, provide both the initial and final tests, compile and analyze data from these one hundred cities and deduce conclusions that would have general value in educational work. The United States Bureau of Education would thus develop an influence in the field of education similar to that exerted by the Department of Agriculture in its sphere. Bulletins of the United States Bureau of Education would then be read and studied by progressive teachers and school administrators as the Agricultural Bulletins are now read by leaders in agriculture. Such work would enable every community to profit by the experience of other communities by adopting the really successful plans and avoiding or discarding those found to be unsuccessful. Under present conditions, however, although a given method may prove unsuccessful in a score of communities this year, another group of communities may try the same method next year, not knowing that it has already failed or been discarded. Thus an unsuccessful method, if well-advertised, may gain admittance into many school systems only to be cast into the educational "junk pile" in time.

Second. Testing drill material, books, and school appliances.

Third. Conducting at various points in the United States educational experiment stations, and making preliminary tests of certain methods before extending their use to other localities. If the

vertical system of handwriting had been tested out for a few years in a large commercial center, its shortcomings would have been discovered, and it probably would not have spread over the country.

Fourth. Investigating many of the large problems of school administration that can be settled only by nation-wide study. These studies should be impartial and should not be conducted by enthusiastic advocates of the scheme to be studied. This caution is submitted because even the United States Bureau is thought to have sometimes fallen under the influence of emotionalists and educational promoters. The value of the Gary system, as referred to above, is a problem of national importance. The same Bureau of Education should be able to make a survey of the Gary Schools in operation in various places, and to secure accurate data as to the results that are being obtained. In the course of ten or twelve years, the country could know the facts with regard to this organization. Kansas City and several southern cities have a seven-year course of study in the elementary schools. If it is possible to cover the course satisfactorily in seven instead of eight years, the entire educational world should be made aware of this fact by an impartial study of the work of these seven-year systems furnished by the United States Bureau of Education. The movement to establish junior high schools is well under way. The value of this type of organization should be established, and no agency could do so better than the United States Bureau of Education.

While, therefore, there are many problems, both large and small which await solution, the value of the solution of many of them, it is urged, would be greatly enhanced if it were made from an authoritative, impersonal, and national point of view.

CHAPTER XII

A LOOK FORWARD

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A paper dealing with the future can justify itself in a scientific volume of this kind only when it bases itself on an analysis of present conditions and aims to develop as a result of such an analysis suggestions for improvements and enlargements of the movement under discussion. The reader is warned, therefore, at the beginning that this paper looks backward as well as forward, in order that justification may be furnished for some of the plans urged as desirable for the future.

One fact which is evident to every student of school problems is that the movement toward the development of measurements is both promoted and seriously encumbered by a vague popular demand. Parents have heard that there are methods of finding out whether their children can spell or add or read satisfactorily, and immediately a clamor arises for a measurement of the local school. The demand is likely to be especially keen if there is some parent in the community who does not like the superintendent or the principal. Such a parent never for a moment believes that responsibility for unsatisfactory school results is to be traced to the native limitations in the ability of his child or to the home atmosphere in which the child grows up. Such a parent is quite certain that measurement will detect at some point a lack of perfection, and then he knows that his dislike for the school officer will have the sanction of science.

It is little wonder that school superintendents have often been afraid to have their schools measured. Especially hazardous is it to have the schools measured in many respects in a single survey. The number of imperfections sure to be revealed in a general survey is appalling. One has the same dread of going to a dentist to have

his teeth examined, knowing well that one's teeth are sure to 'go to pieces' under the keen scrutiny of the expert. The case would be still worse for most of us if we were obliged to submit the imperfections of our features to the relentless analysis of an expert in physiognomy.

In the presence of a popular demand for the revelation of imperfections and the absolute certainty that imperfections exist, it is not difficult to understand why there should be a tendency on the part of many school officers to combat the movement toward wide-spread measurement.

The future is sure to develop a new and more wholesome attitude on the part both of the public and of school officers. Indeed, the measurements which have been made up to this time have more than justified their cost in effort and money, because they have dispelled forever the idea that schools should produce a uniform product or one that is perfect in its attainments. We all understand now in definite scientific terms that children are different from one another, that the lower grades progress slowly toward satisfactory results, that movement within the school is purchased at great expenditure of labor on the part of all concerned, and that the best we can hope for is improvement—not absolute achievement of ideals.

With the theoretical ideal of perfection overthrown, there is now an opportunity to set up rational demands. We can venture to tell parents with assurance that their children in the fifth grade are as good as the average if they misspell fifty percent of a certain list of words. We know this just as well as we know that a certain automobile engine cannot draw a ton of weight up a certain hill. No one has a right to make an unscientific demand of the automobile or of the school.

As soon as school officers recognize the fact that measurements define for them just how much may reasonably be demanded, they will be unafraid of measurements. Indeed, they will learn the administrative lesson that it is better to know for purposes of ordinary routine what ought to be demanded than merely to guess at conditions. The writer once heard a business man put the matter very clearly. He was looking at some diagrams that showed the results

of a study of schools. "This," he said, "is the sort of thing business has learned to do. We used to be offended if anyone criticised our methods or commented on our results. Now we know that our best friend is the man who comes and tells us exactly where we stand. The one thing business cannot approve is ignorance about results. We do not fool ourselves any more, come what will of the revelation."

The school principal who knows in advance where his school is weak and where it is strong, is armed against criticism. But more than that, he is guided in his future efforts. The purely negative result that adverse judgment causes no shock, is of some importance, but the positive result that the school is stimulated to improve itself is a matter of supreme advantage. If we can devise methods of knowing ourselves, we shall take up the tasks of self-improvement with assurance and with discrimination.

The first prophecy, then, which one can venture with a good deal of assurance is that school officers will learn to anticipate popular demands and will thereby come into possession of information which will guide them in their own work.

A second general fact about measurement is that up to this time it has dealt with very broad problems and usually has grouped together great masses of results. This is seen in the fact that one speaks in a large way about medians of thousands of cases. The sheer breadth of our studies has intimidated teachers. They feel that the machinery is set up to deal with systems of schools, but not with their detailed problems.

It is natural enough that the beginnings of this science should concern themselves with broad, remote facts. So it has always been. The race developed astronomy first because celestial facts are remote and on a vast scale. It is only in the latter days of refined scientific study that we have come to know details about our own bodies and the facts of social organization.

Thanks to the energy which has been expended in scientific work, we have the gross methods well in hand. Refinement of methods has begun. Formerly we used to compare school system with school system. We shall continue this, but we can now begin to use our methods for the more specific study of individual cases.

Take, for example, the refinements which Ayres has added to his last writing scale. Along the bottom are the figures which tell the teacher in detail how speed and quality are distributed in the normal class. There is in this refinement a larger recognition of the teacher and of the classroom contact between teacher and pupil. One can not help recognizing that measurement is becoming surer of itself and is taking up details. The broad first facts have been collected and formulated. Now there is a penetration to the deeper problem—one is almost tempted to say to the real problem.

As soon as teachers learn the possibility of using definite measurement to solve their individual problems, they will share with superintendents the attitude which was described above of wanting to uncover the exact facts. Here, for example, is a difficult pupil. How far is he behind the class at the opening of the school year? How rapidly does he progress? Whatever the answer, the teacher will be aided in directing the pupil's work if that answer can be known with definiteness and detail.

Everywhere there are indications that measurements are to be used by the teacher. The results of supervised study are being measured. The results of different methods of teaching are being accurately determined. Thus, different systems of reading, different methods of teaching long division, and different methods of manipulating the decimal point are being studied.

Up to this time, teachers, partly because they shared the dread of measurements and partly because they thought of measurements as remote, have stood aloof from the movement. Now there appear the beginnings of a tendency to make measurement a part of the class routine. The arithmetic lesson serves at once as a drill exercise and as an opportunity for measuring results. The rhythmical beating of time in writing helps in the formation of a habit and tells the teacher what members of the class, if any, are lacking in skill. The measurement of rate in reading helps the teacher to decide which members of the class require special attention.

These beginnings mark the path along which the measurement movement must travel in the coming years. There is need of new energy in devising methods of class routine which will bring to the teacher the exact results which will show how successful has been

the work of the class and of the individual. Those who complain that the teacher does not have time to make measurements miss the point entirely. The teacher often wastes time and effort under existing conditions because of ignorance of the direct point where application of teaching energy would be most effective. The right kind of classroom measurements, as suggested in the examples cited above, do not interrupt class routine at all, but contribute exact methods of procedure at the same time that they reveal to the teacher where the class stands.

A conception such as that given in the last paragraphs will also clear up another difficulty which teachers sometimes point out. They complain that the volume of experimentation is so great that the class exercises are disorganized and disrupted. The advice which ought to be given to a teacher who makes this complaint is that one kind of class exercise should be transformed at a time. Methods should be built up in each subject which serve both the purposes of measurement and of teaching. This can be done, but it requires readjustment and planning.

The second prophecy which one may venture is, accordingly, that measurement will more and more take up details and will become a common instrument in the hands of the classroom teacher.

One objection which has been urged again and again against measurement is that it deals only with the formal and mechanical aspects of education. This objection has nowhere been more definitely stated than by Superintendent Horn in his *Supplementary Survey of Portland Public Schools* where he writes as follows:

"It should furthermore be kept in mind that there are many things about a school system which can never be definitely measured or stated with mathematical accuracy. Just where the line is to be drawn between the measurable and the non-measurable elements that enter into a school is a matter concerning which there is much difference of opinion. In other words, the element of opinion enters to some extent even into the matter of the possibility of measurement.

"For instance, it is an undoubted fact that any man can go into a city and count the school houses or the number of the desks. Any man can find out the number of teachers employed. Any man can count for himself the number of pupils present in a given room.

"It takes no particular ability to enable an inquirer to find out just how much money is being spent. If the schools spent nine hundred thousand dollars in one year and a million dollars the next year, any one can deduce the fact that they spent one hundred thousand dollars more the second year than the first year.

"On the other hand, after a comparatively few such facts have been definitely ascertained, we come to subjects that cannot be measured in mathematical terms, and concerning which there are no definite standards. In this realm ideals are not always definitely established and opinions are almost certain to vary widely.

"For instance, if you take two classes, one across the hall from the other, who can decide in which of the classes the higher ideal of truthfulness or honesty prevails? Who can say which teacher is more successful in making the children self-reliant, and to what extent? We all know that in such a case, if the two teachers are both fairly good, many pupils and patrons will consider one the better teacher, while many others will consider the other the better. Especially will this be true with reference to such matters as the teaching of honesty, industry and self-reliance. Incidentally, these very things are recognized as being among the most important of all the elements entering into the question of the teacher's efficiency. A school that turns out manly, honorable, self-reliant boys and womanly, efficient girls is likely to be at least a fairly good school, no matter what it may do otherwise. A school that fails to turn out such pupils can hardly be considered a good one, no matter what it may do for its pupils in the way of reading, or writing, or arithmetic. And yet these very things, which may decide between the success or failure of the school, are matters which it is almost impossible to estimate accurately, and concerning which there may be a wide amount of honest difference of opinion."¹

The success of the measurement movement depends on its ability to meet this type of objection.

Some of us might be entirely willing to rest the case after asking whether in practical school life anyone ever saw a teacher thoroughly competent in teaching ideals but neglectful of reading and arithmetic. The fact is that the conscientious teacher always gives attention to both, and the successful teacher is able without omitting one to cultivate the other. The theoretical possibility of thinking of the two results separately has little significance in dealing with real teachers and real schools. Good reading is a school virtue, and

¹P. W. Horn, *Report of Supplementary Survey of Portland Public Schools*, pp. 6-7. April, 1917.

when one has measured good reading, he has measured more than the trivial or formal side of education.

The hope of the measurement movement is, however, to do more than to deny the validity of such criticism as Mr. Horn makes. There is to be progress in covering more fully the details of school work. Today we know how to measure many aspects of teaching. The reason for our early attack on the formal elements is that these yield readily to analysis and thus to theoretical isolation and exact treatment. What we need to do is to carry our analysis further and then new measurements will become easier.

A few years ago reading tests seemed impossible. Today we have mastered the distinction between oral and silent reading. We have good methods of measuring some of the more common types of deficiency and we know the rate of progress which is normal in the more obvious phases of interpretation. The progress in this field within a single year is so large that there is nothing but optimism in the minds of those carrying on the work. What we need is more interest on the part of practical workers and more experimentation with methods.

Those of us who have watched the progress of measurement will recall distinctly that the earliest critics of the movement were more emphatic than the present-day critics in declaring that school results could not be measured. This type of criticism was the one with which Mr. Rice's opponents thought they had forever eliminated him and his type of work from the schools. Steadily the range of measurements has broadened. Steadily the productivity of the movement has increased. It is not for the advocate of the movement to prophesy its limits; it is perfectly safe for him, however, to assure all the world that the end is not yet in sight. So long as advantage comes from the pushing forward of this movement, so long as ingenuity is at hand to devise new modes of procedure, the answer to the objection that measurement is limited to a few trivial aspects of teaching is steadily becoming more cogent.

This hopeful conclusion is fully supported by one fact which serves at the same time to reveal one of the most important advantages of measurement, namely, the fact that with the develop-

ment of measurement there is coming into education a greater general clearness and definiteness of purpose.

An example will show what is meant. In the high school of Kansas City, Kans., there is a system of telling the students definitely and in detail what they must do if they want to secure the higher grades, *A* or *B*, in a given course. The very fact that students in that school have all along been given *A*, *B*, and *C* shows that measuring of all sorts of intellectual and moral qualities has been going on. The interesting fact is that in most places the measuring is vague and often unsatisfactory, because no one has taken the pains to define what is wanted. Students know that teachers are often arbitrary, and, be it confessed, teachers also know that they are vague. The system referred to above removes some of the ambiguities. It improves the measuring system, making it definite and exact, because it analyzes and defines the elements of work demanded.

Suppose that the teachers of a school should concentrate for half a year on cultivating the power of concentration of attention. Is there any doubt that much new information would be gained about concentration and that there would be more accurate methods of determining its degree? Measurement will be extended in the future. The reasons why one can be so sure about this statement are to be found in the history of the past few years.

The third prophecy that can be made is, therefore, that the scope of measurement will be widened until it is sufficiently inclusive to satisfy even the most exacting critic. Concentration of attention, ability to attack various kinds of problems, clearness of insight, power of inference in various fields will be measured. The demand again is for workers who will give themselves the training in analysis and take the pains in collecting material that is necessary to bring about this consummation.

It may be unscientific to prophesy about the remoter social consequences of such a movement as we are discussing, but certain final observations may serve to show why the advocates of measurement in education are unlimitedly optimistic. The time is rapidly passing when the reformer can praise his new devices and offer as the reason for his satisfaction, his personal observation of what was

accomplished. The superintendent who reports to his board on the basis of mere opinion is rapidly becoming a relic of an earlier and unscientific age. There are indications that even the principals of elementary schools are beginning to study their schools by exact methods and are basing their supervision on the results of their measurements of what teachers accomplish. A social change of this kind is adequate justification for any movement and a sufficient guarantee for its continuance.

CHAPTER XIII

EDNA BRYNER

Russell Sage Foundation, New York City

A SELECTED BIBLIOGRAPHY OF CERTAIN PHASES OF EDUCATIONAL MEASUREMENT

These magazine articles, bulletins, reports, books and surveys are grouped on the basis of similarity of general content and are arranged alphabetically within each division according to authors.

Divisions

- A. Theory of Educational Measurement and Development of the Movement.
- B. Tests and Scales in Various School Subjects.
- C. General Reports on the Use of Tests and Scales in Schools
- D. Lists of Tests and Scales
- E. Correlations between Abilities
- F. Teachers' Measurement
- G. Articles about Surveys and Lists of Surveys
- H. City Surveys
- I. State, County and other surveys.

Abbreviations

- AmEd*: American Education
- AmJPs*: American Journal of Psychology
- AmScBdJ*: American School Board Journal
- BrJPs*: British Journal of Psychology
- Ed*: Education
- EdAdm*: Educational Administration and Supervision
- EdPsMon*: Educational Psychology Monographs
- ElScJ*: Elementary School Journal
- ElScTch*: Elementary School Teacher
- EngJ*: English Journal
- IndianaConfMes*: Annual Conference on Educational Measurements, Indiana University
- IndianaUnSd*: Indiana University Studies
- JEdPs*: Journal of Educational Psychology

JEPd: Journal of Experimental Pedagogy
KansasBurMes: Studies by the Bureau of Educational Measurement Kansas State Normal School.
NaEdAsBu: National Education Association Bulletin
PdSe: Pedagogical Seminary
ProcDepSupt: Proceedings Department Superintendence National Education Association
PopSciM: Popular Science Monthly
ProcNaEdAs: Proceedings National Education Association
PsCl: Psychological Clinic
ScHomeEd: School and Home Education
Sci: Science
ScR: School Review
ScRMon: School Review Monographs
ScSciMat: School Science and Mathematics
ScSoc: School and Society
Tch: Teaching
TchCollConEd: Teachers College Contributions to Education
TchCollRec: Teachers College Record
UnIowaExtBu: University of Iowa Extension Bulletin
USBurEdBu: United State Bureau of Education Bulletins
YbNaSoc: Yearbook of the National Society for the Study of Education

DIVISION A

THEORY OF EDUCATIONAL MEASUREMENT AND DEVELOPMENT OF THE MOVEMENT

1. Alexander, C. Standard tests as an aid in supervision. *AmScBdJ*, 54: 1917, 17-18, 66-67, 69.
2. Ayres, L. P. Measuring educational processes through educational results. *ScR*, 20: 1912, 300-309.
3. Ayres, L. P. The economy of time through testing the course of study and time allotment. *ProcNaEdAs*, 1913, 241-246.
4. Ayres, L. P. Making education definite. *Second IndianaConfMes*, 13: 1915, 85-96.
5. Ayres, L. P. The measurement of educational processes and products. *Second IndianaConfMes*, 13: 1915, 127-133.
6. Ayres, L. P. Significant developments in educational surveying. *ProcDepSupt*, 4: May, 1916, 104-111.
7. Bagley, W. C. The need of standards for measuring progress and results. *ProcNaEdAs*, 1912, 634-639.
8. Ballou, F. W. The function of a department of educational investigation and measurement in a school system. *ScSoc*, 1: Feb. 6, 1915, 181-190.
9. Ballou, F. W. Improving instruction through educational measurement. *EdAdm*, 2: June, 1916, 354-367; also *NaEdAsBu*, 4: 1916, 196-203.
10. Ballou, F. W. Training normal-school seniors in educational measurement. *ScSoc*, 5: Jan. 20, 1917, 61-70.
11. Birch, T. B. Standard tests and scales of measurement. *PsCl*, 10: April, 1916, 49-57.
12. Bliss, D. C. School measurements and school administration. *EdAdm*, 1: Feb., 1915, 77-88.

13. Bliss, D. C. The application of standard measurements to school administration. *Fifteenth YbNaSoc*, Pt. I, 1916, 69-78.
14. Bobbitt, F. Some general principles of management applied to the problems of city school systems. *Twelfth YbNaSoc*, Pt. I, 1913, 7-96.
- 14a. Bowley, A. L. *Elements of statistics*. New York, 1907.
- 14b. Bowley, A. L. *An Elementary Manual of Statistics*. London, 1915.
15. Buckingham, B. R. Principles of scale derivation with special application to arithmetic, geography, history and grammar, with round table. *Third IndianaConfMes*, 2: Feb., 1917, 49-84.
16. Colvin, S. Marks and the marking system as an incentive to study. *Ed*, 32: May, 1912, 560-572.
17. Curtis, S. A. The comparative test as an educational ruler. *AmEd*, 15: Sept., 1911, 13-18.
18. Curtis, S. A. Measuring the child's capacity. *Normal Instructor and Primary Plans*, 1916: Oct., 31, 76; Nov. 53-54, 82; Dec. 45-46.
19. Curtis, S. A. Objective standards as a means of controlling instruction and economizing time. *ScSoc*, 1: Mar. 27, 1915, 433-436.
20. Curtis, S. A. Supervisory control by means of objective standards. *Second IndianaConfMes*, 13: Oct., 1915, 37-68.
21. Curtis, S. A. Educational diagnosis. *Second IndianaConfMes*, 13, 1915, 135-171; also *EdAdm*, 1: Feb., 1915, 89-116.
22. Curtis, S. A. Standardization of teachers' examinations. *ProcNaEdAs*, 1916: 1078-1086.
23. Cubberley, E. P. *Public School Administration*. Boston, 1916, 324-343.
24. Cubberley, E. P. Standard tests in the work of school administration: round table. *Third IndianaConfMes*, 2, 1917, 21-34.
25. Cubberley, E. P. Significance of educational measurements. *Third IndianaConfMes*, 2: 1917, 6-20.
- 25a. Elderton, W. P. and Ethel M. *Primer of Statistics*. London, 1912.
26. Haggerty, M. E. Some uses of educational measurements. *ScSoc*, 4: Nov. 18, 1916, 762-771.
27. Haggerty, M. E. Measurement and diagnosis as aids to supervision. *ScSoc*, 6: Sept. 8, 1917, 271-285.
28. Hall-Quest, A. L. Measuring the ultimate product. *ScSoc*, 1: May 29, 1915, 767-773.
29. Kelley, T. L. Educational guidance: an experimental study in the analysis and prediction of ability of high-school pupils. *TchCollConEd*, No. 71: 1914, pp. 116.
- 29a. King, W. I. *The elements of statistical method*. New York 1912.
30. Kirkpatrick, E. A. Measurements, standards and teaching. *ScSoc*, 1: Feb. 20, 1915, 278-281.
31. Learned, W. S. The school system as an educational laboratory. *Harvard-Newton Bulletins*, No. 1: July 1914, Cambridge, Mass. pp. 50.
32. Littell, H. V. Testing efficiency in schools. *Proceedings 28th Annual Meeting Associated Academic Principals and Council of Elementary Principals and Teachers, State of New York*, 1912, 67-75.
33. Manahan, J. L. Standard educational tests and educational administration. *High School Quarterly*, 5: July, 1917, 247-250.
34. Maxwell, W. H. Efficiency of schools and school systems. *ProcNaEdAs*, 1915, 395-402.
35. Melcher, G. The two phases of educational research and efficiency in the public schools. *ProcDepSupt*, 4: May, 1916, 183-188.
36. Meriam, J. L. Measuring school work in terms of life out of school. *ScSoc*, 5: Mar. 24, 1917, 339-342.

37. Monroe, W. S. Standard tests and their uses. *Tch*, 1: Nov. 15, 1914, 9-14.
38. Rice, J. M. *Scientific Management in Education*. New York, 1913, pp. 282.
39. Rugg, H. O. The experimental determination of mental discipline in school studies. *EdPsMon*, No. 17: 1916, pp. 132.
- 39a. Rugg, H. O. *Statistical methods applied to education*. New York, 1917. 410 pp.
40. Scott, F. N. Efficiency for efficiency's sake. *ScR*, 23: Jan., 1915, 34-42.
41. Spaulding, F. E. The application of the principles of scientific management. *ProcNaEdAs*, 1913, 259-279.
42. Spaulding, F. E. Measurement of efficiency in elementary and secondary schools. *Ed*, 34: Dec., 1913, 225-248.
43. Starch, D. Standard tests as aids in the classification and promotion of pupils. *Fifteenth YbNaSoc*, Pt. 1, 1916, 143-148.
44. Stockton, J. L. *Exact Measurements in Education*. Chicago and New York, 1915, 57 pp.
45. Strayer, G. D. Measuring results in education. *JEdPs*, 2: 1911, 3-10.
46. Strayer, G. D. Is scientific accuracy possible in the measurement of the efficiency in instruction? *Ed*, 34: Dec., 1913, 249-258.
47. Strayer, G. D. The use of tests and scales of measurement in the administration of schools. *ProcNaEdAs*, 1915, 579-582.
48. Strayer, G. D. and Thorndike, E. L. *Educational administration: quantitative studies*. New York, 1913, pp. 391.
49. Thompson, J. E. Educational measurements. *ScHomeEd*: Nov., 1916, 69-72.
50. Thorndike, E. L. Quantitative investigations in education. *ScRMon*, No. 1: 1911, 33-52.
51. Thorndike, E. L. The measurement of educational products. *ScR*, 20: May, 1912, 289-299.
52. Thorndike, E. L. *An Introduction to the Theory of Mental and Social Measurements*. New York City, 1913, pp. 277.
53. Thorndike, E. L. Units and scales for measuring educational products. *Proc. Conference on Educational Measurements, Indiana University Bulletin*, 12, No. 10, 1914, 128-141.
54. Thorndike, E. L. Individual differences and their causes. *Proc. Conference on Educational Measurements, Indiana University Bulletin*, 12, No. 10; 1914, 59-76.
55. Thorndike, E. L. Round table: the use of the new educational scales in ordinary school practice. *Proc. Conference on Educational Measurements, Indiana University Bulletin*, 12, No. 10; 1914, 142-154.
56. Whipple, G. M. The use of mental tests in the school. *Fifteenth YbNaSoc*, Pt. I, 1916, 149-159.
57. Woody, C. Tests and measures in the schoolroom and their value to teachers. *ScSoc*, 6: July 21, 1917, 61-66; also *Northwest Journal of Education*, 28: Dec., 1916, 154-158.
- 57a. Zizek, Franz. *Statistical Averages*. Translated by W. M. Persons. New York, 1913.

DIVISION B

TESTS AND SCALES IN THE VARIOUS SCHOOL SUBJECTS*

Algebra

58. Childs, H. G. The measurement of achievement in algebra. *Third IndianaConfMes*, 2: 1917, 171-183.

*For further information concerning addresses of those whose tests are listed here, see Ch. VII.

59. Childs, H. G. *Indiana Algebra Tests*. Columbia City, Ind.
60. Monroe, W. S. A test of the attainment of first-year high-school students in algebra. *ScR*, 23: Mar., 1915, 159-171.
61. Monroe, W. S. Measurements of certain algebraical abilities. *ScSoc*, 1: Mar. 13, 1915, 393-395.
62. Monroe, W. S. Standard research tests in algebra. *KansasBurMes*.
63. Rugg, H. O. *Standardized Tests in First-year Algebra*. University of Chicago, Chicago, Ill.
64. Rugg, H. O. The experimental determination of standards in first-year algebra. *ScR*, 24: Jan., 1916, 37-66.
65. Rugg, H. O. and Clark, J. R. *Standardized Practice Exercises in First-year Algebra*. University of Chicago, Chicago, Ill.
66. Rugg, H. O. and Clark, J. R. Standardized tests and the improvement of teaching in first-year algebra. *ScE* 25: Feb. and Mar., 1917, 113-132 and 196-213.
67. Rugg, H. O. and Clark, J. R. A co-operative investigation in the testing and experimental teaching of first-year algebra. *ScR*, 25: May, 1917, 346-349.
68. Rugg, H. O. and Clark, J. R. The improvement of ability in the use of the formal operations of algebra by means of formal practice exercises. *ScR*, 25: Oct., 1917, 546-554.
69. Stromquist, C. E. *Preliminary Algebra Tests*. Univ. of Wyoming, Laramie, Wyoming.

Arithmetic

70. Ashbaugh, E. J. The arithmetical skill of Iowa school children. *UnIowa ExtnBu*, 24: Nov., 1916, pp. 63.
71. Baldwin, B. T. The application of the Courtis tests in arithmetic to college students. *ScSoc*, 1: Apr. 17, 1915, 569-576.
72. Ballard, P. B. Norms of performance in the fundamental processes of arithmetic. *JEPd*, 2: Dec., 1914, 396-405; vol. 3, Mar., 1915, 9-20.
73. Ballou, F. W. Educational standards and educational measurements, with particular reference to standards in the four fundamentals of arithmetic. *Bulletin No. 3, School Document No. 10*, 1914. Boston, pp. 21.
74. Bell, J. C. A class experiment in arithmetic. *JEdPs*, 5: Oct., 1914, 467-470.
75. Bonser, F. G. The reasoning ability of children of the fourth, fifth and sixth school grades. *TchCollConEd*, 37: New York City, 1910, pp. 133.
76. Bonser, F. G. The selective significance of reasoning ability tests. *JEdPs*, 7: Apr., 1916, 187-200.
77. Boston, Department of Educational Investigation and Measurement. Provisional minimum standards in addition, subtraction, multiplication and division for pupils in grades 4 to 8. *Bulletin No. 2, School Document No. 9*, 1914, Boston, pp. 37.
78. Boston, Department of Educational Investigation and Measurement. Arithmetic. Determining the achievement of pupils in addition of fractions. *Bulletin No. 7, School Document No. 3*, 1916, Boston, pp. 28.
79. Boston, Department of Educational Investigation and Measurement. Arithmetic: the Courtis standard tests in Boston, 1912-1915. An appraisal. *Bulletin No. 10, School Document No. 15*, 1916, Boston, pp. 48.
80. Brown, J. C. An investigation on the value of drill work in the fundamental operations of arithmetic. *JEdPs*, 2: Feb., 1911, 81-88; 3: Nov., 1912, 485-492; Dec., 1912, 561-570.

81. Buckingham, B. R. The Courtis tests in the schools of New York City. *JEdPs*, 5: Apr., 1914, 199-214.
82. Buckingham, B. R. Notes on the derivation of scales in school subjects: with special application to arithmetic. *Fifteenth YbNaSoc*, Pt. I, 1916, 23-40.
83. Bush, M. G. The fundamental number facts. *ScSoc*, 6: Sept. 1, 1917, 265-268.
84. Cajori, F. A new marking system and means of measuring mathematical abilities. *ScSciMat*, 14: Apr., 1914, 283-293.
85. Chapman, J. C. A study of initial spurt in the case of addition. *JEdPs*, 6: Sept., 1915, 419-426.
86. Chase, S. E. Waste in arithmetic. *TchCollRec*, 18: Sept., 1917, 360-370.
87. Childs, H. G. A half-year's progress in the achievement of one school system as measured by the Courtis tests, Series B. *Fifteenth YbNaSoc*, Pt. I, 1916, 83-90.
- 87a. Cobb, Margaret V. A preliminary study of the inheritance of arithmetical abilities. *JEdPs*, 8: Jan., 1917, 1-20.
88. Cole, L. W. Adding upward and downward. *JEdPs*, 3: Feb., 1912, 83-94.
89. Conard, H. E. and Arps, G. F. An experimental study of economical learning. *AmJPs*, 27: Oct., 1916, 507-529.
90. Counts, G. S. Arithmetic tests and studies in the psychology of arithmetic. *Supplementary Educational Monographs*, 1, No. 4: Aug. 27, 1917, pp. 125.
91. Courtis, S. A. Measurement of growth and efficiency in arithmetic. *ElScTch*, 10: Oct. and Dec., 1909, 58-74 and 177-199; 11: Dec., 1910, and Mar., 1911, 171-185 and 360-370.
92. Courtis, S. A. Standard scores in arithmetic. *ElScJ*, 12: Nov., 1911, 127-137.
93. Courtis, S. A. The Courtis tests in arithmetic. *Final Report, Committee of School Inquiry, Board of Estimate and Apportionment, New York City*, I: 1911-1912, pt. 2, 389-546.
94. Courtis, S. A. First annual accounting of the Courtis Standard Research Tests, 1911-12; also, reprints of articles published during the year. *Bulletin No. 1, Department of Cooperative Research*, Detroit, Mich., pp. 31.
95. Courtis, S. A. Second annual accounting of the Courtis Standard Research Tests, 1912-1913; also, Standard scores and teaching of the tables. *Bulletin No. 2, Department of Cooperative Research*, Detroit, Mich., pp. 31.
96. Courtis, S. A. The reliability of single measurements with standard tests. *ElScJ*, 13: March and June, 1913, 326-345 and 486-504.
97. Courtis, S. A. Third, fourth and fifth annual accounting of the Courtis Standard Research Tests, 1913-1916; also Capacity; ability and performance in relation to standard scores and summary of tabulations. *Bulletin No. 4, Department of Cooperative Research*, Detroit, Mich., pp. 111.
98. Courtis, S. A. Courtis tests in arithmetic: value to superintendents and teachers. *Fifteenth YbNaSoc*, Pt. I, 1916, 91-106.
99. Courtis, S. A. Research work in arithmetic. *EdAdm*, 3: Feb., 1917, 61-74.
100. Courtis, S. A. *Arithmetic Tests, Series A and Series B*. Detroit, Mich.
101. Courtis, S. A. *Practice Tests in Arithmetic*. Yonkers, N. Y., 1917.
102. Davies, G. R. Elements of arithmetical ability. *JEdPs*, 5: Mar., 1914, 131-140.

103. Dockerill, W. H. A. and Fennings A. J. A new test of reasoning. *JEPd*, 2: June, 1914, 356-361.
- 103a. Drushel, J. A. A study of the amount of arithmetic at the command of high-school graduates who have had no arithmetic in their high-school course. *ElScJ*, 17: May, 1917, 657-661.
- 103b. Fox and Thorndike. The relationship between the different abilities in the study of arithmetic. *TchCollConEd*, Feb., 1913, 32-40.
104. Gist, A. S. Errors in the fundamentals of arithmetic. *ScSoc*, 6: Aug. 11, 1917, 175-177.
105. Gray, P. L. Norms of performance in the fundamental processes of arithmetic. *JEPd*, 3: June, 1916, 310-318.
106. Green, J. A. Normal performances in fundamental arithmetical processes. *JEPd*, 3: June, 1916, 318-322.
107. Haggerty, M. E. Arithmetic: a cooperative study in educational measurements. *IndianaUnSd*, No. 27: *IndianaUnBu*, 12: 1915, 385-508.
108. Haggerty, M. E. (Ed.) Studies in arithmetic. *IndianaUnSd*, 3, Sept. 1916, pp. 109.
109. Hahn, H. H. and Thorndike, E. L. Some results of practice in addition under school conditions. *JEdPs*, 5: Feb., 1914, 65-84.
- 109a. Hanus, P. H. and Gaylord, H. D. Courtis arithmetic tests applied to employees in business houses. *EdAdm*, 3: Nov., 1917, 505-520.
- 109b. Heck, W. H. The efficiency of grammar-grade pupils in reasoning tests in arithmetic at different periods of the school day. *JEdPs*, 5: 1914, 92-95.
- 109c. Heilman, J. D. and Shultis, F. W. A study in addition. *Research Bulletin No. 1*, State Teachers College of Colorado, Greeley, 1916.
110. Hill, D. S. Measurements by the Courtis arithmetic tests. *Annual Report of the New Orleans Public Schools*, 1915-16, Pt. 3, 74-77.
111. Hinkle, E. C. Tests for efficiency in arithmetic. *Educational Bi-monthly*, 8: Dec., 1913, 123-135.
112. Hinkle, E. C. Experiments for efficiency in arithmetic. The Courtis tests. *Educational Bi-monthly*, 8: Feb., 1914, 189-201.
113. Holloway, H. V. *The Relative Difficulty of the Tables*. State Gazette Pub. Co., Trenton, N. J.
- 113a. Howell, H. B. *A Fundamental Study in the Pedagogy of Arithmetic*. New York, 1914, pp. 328.
114. Jessup, W. A. Current practices and standards in arithmetic. *Fourteenth YbNaSoc*, Pt. I, 1915, 116-130.
- 114a. Jessup, W. A. Economy of time in arithmetic. *ElScTch*, 14: June, 1914, 461-576.
- 114b. Jessup, W. A. Grade for introduction of a text in arithmetic. *ElScJ*, 15: Nov., 1914, 162-166.
115. Jessup, W. A. and Coffman, L. D. *The Supervision of Arithmetic*. New York, 1916, pp. 225.
116. Judd, C. H. *Cleveland Arithmetic Tests*. Univ. of Chicago, Chicago, Ill.
117. Kelly, F. J. Teacher's marks: their variability and standardization. *TchCollConEd*, 66: 1914, pp. 139.
118. Kerr, Mary. Use of Courtis tests in central school building, Bloomington, Ind. *IndianaConfMes*, 12: 1914, 90-94.
119. Kirby, T. J. Practice in the case of school children. *TchCollConEd*, 58: 1913, pp. 98.
120. Kirkpatrick, E. A. An experiment in memorizing vs. incidental learning. *JEdPs*, 5: Sept., 1914, 405-413.
121. Lane, H. A. Standard tests as an aid to supervision. *ElScJ*, 15: March, 1915, 378-386.
122. McDougle, E. C. A contribution to the pedagogy of arithmetic. *PdSe*, 21: June, 1914, 161-218.

- 122a. Mead, C. D. *An Experiment in the Fundamentals*. Yonkers, 1917.
123. Mead, C. D. and Sears, Isabel. Additive, subtractive, and multiplicative division tested. *JEdPs*, 7: May, 1916, 261-270.
124. Monroe, W. S. An experimental and analytical study of Woody's arithmetic scales, Series B. *ScSoc*, 6: Oct. 6, 1917, 412-420.
125. Monroe, W. S. A report of the use of the Courtis Standard Research Tests in arithmetic in twenty-four cities. *KansasBurMes*, 4: No. 8, pp. 94.
- 125a. Monroe, W. S. The ability to place the decimal point in division. *ElScJ*, 18: Dec., 1917, 287-293.
126. Otis, A. S. and Davidson, P. E. The reliability of standard scores in adding ability. *ElScTch*, 13: Oct., 1912, 91-105.
127. Phelps, C. L. A study of errors in tests of adding ability. *ElScTch*, 14: Sept., 1913, 29-39.
128. Phillips, F. M. A comparison of the work done in successive minutes of a ten-minute practice period in the fundamentals of arithmetic. *JEdPs*, 7: May, 1916, 271-277.
- 128a. Phillips, F. M. Value of daily drill in arithmetic. *JEdPs*, 4: 1913, 159.
129. Rice, J. M. Educational research: arithmetic. *The Forum*, 34: Oct., 1902 to June, 1903, 281-297, 437-452, 588-607. Reprinted in *Scientific Management in Education*, New York, 1913.
130. Scott, W. Errors in arithmetic. *JEPd*, 3: June 5, 1916, 296-307.
131. Smith, A. O. Preliminary reports of the Lough-Smith tests in arithmetic. *AmED*, 17: March, 1914, 410-411.
132. Smith, J. H. Individual variations in arithmetic. *ElScJ*, 17: Nov., 1916, 195-200.
133. Starch, D. Transfer of training in arithmetical operations. *JEdPs*, 2: 1911, 306-310.
134. Starch, D. A scale for measuring ability in arithmetic. *JEdPs*, 7: April, 1916, 213-222.
135. Starch, D. *Starch's Arithmetic Test*. Madison, Wis.
136. Starch, D. and Elliott, E. C. Reliability of grading work in mathematics. *ScR*, 21: April, 1913, 254-259.
137. Stone, C. W. Problems in the scientific study of the teaching of arithmetic. *JEdPs*, 4: Jan., 1913, 1-16.
138. Stone, C. W. Arithmetical abilities and some factors determining them. *TchCollConEd*, 19: 1908, pp. 101.
139. Stone, C. W. *Standardized Reasoning Tests in Arithmetic and How to Utilize Them*. New York City, 1916, pp. 24.
140. Stone, C. W. *A Reasoning Test in Arithmetic*. New York City.
- 140a. Sutton, C. W. The arithmetical abilities of school children as shown by the Courtis tests. *Division of Reference and Research, Cleveland, Ohio. Bulletin No. 1*, Nov., 1917.
141. Taylor, E. H. A comparison of the arithmetical abilities of rural and city school children. *JEdPs*, 5: Oct., 1914, 461-466.
142. Thompson, T. E. *Thompson's Minimum Essentials in Arithmetic*. Manrovia, Calif.
143. Thorndike, E. L. Means of increasing efficiency in arithmetic. *Indiana-UnBu*, 12: 1914, 9-25.
144. Thorndike, E. L. The relation between speed and accuracy in addition. *JEdPs*, 5: Nov., 1914, 537.
145. Thorndike, E. L. Measurements of ability to solve arithmetical problems. *PdSe*, 21: Dec., 1914, 495-503.
- 145a. Thorndike, E. L. Practice in the case of addition. *AmJPs*, 21: 1910, 483.
- 145b. Uhl, W. L. The use of standardized materials in arithmetic for diagnosing pupils' methods of work. *ElScJ*, 18: Nov., 1917, 215.

146. Winch, W. H. Some new reasoning tests suitable for the mental examination of school children. *BrJPs*, 7: Sept., 1914, 190-225.
147. Wood, E. R. Tests in efficiency in arithmetic. *ElScJ*, 17: Feb., 1917, 446-453.
148. Woody, C. Measurements of some achievements in arithmetic. *ScSoc*, 4: Aug. 19, 1916, 229-303.
149. Woody, C. *Measurements of Some Achievements in Arithmetic*. New York City, pp. 63.
150. Woody, C. *Arithmetic Scales*. New York City.
151. Zeidler, R. Tests of efficiency in the rural and village schools of Santa Clara, Cal. *ElScJ*, 16: June, 1916, 542-555.

Drawing

152. Ayer, F. C. *The Psychology of Drawing*. Baltimore, Md., 1916, pp. 186.
153. Childs, H. G. Measurement of the drawing ability of 2,177 children in the Indiana city school systems by a supplemented Thorndike scale. *JEdPs*, 6: Sept., 1915, 391-408.
154. Lobsien, M. *Einige experimentelle Untersuchungen zu einigen Grundfragen der Kunsterziehung*. Langensalza, 1905.
155. Levinstein, S. *Untersuchungen ueber das Zeichnen der Kinder bis zum 14 Lebensjahr*. Leipzig, 1904.
156. Rugg, H. O. A scale for measuring freehand lettering. *JEdPs*, 6: Jan., 1915, 25-42.
157. Rugg, H. O. *A Scale for Measuring Freehand Lettering*. Chicago, Ill.
158. Thorndike, E. L. *Drawing Scale for Grades 5 to 8*. New York City.
159. Thorndike, E. L. The measurement of achievement in drawing. *Tch-CollRec*, 14: Nov., 1913, 345-383.

English Composition, Language, and Vocabulary

160. Ayres, L. P. *Spelling Vocabulary of Personal and Business Letters*. New York City, 1913, 14 pp.
161. Ballou, F. W. Scales for the measurement of English composition. *Harvard-Newton Bulletins*, No. 2, Cambridge, Mass., 1914, pp. 93.
162. Bliss, D. C. Some results of standard tests. *PsCl*, 6: March, 1912, 1-12.
163. Bonser, F. G., Burch, L. H. and Turner, M. R. Vocabulary tests as measures of school efficiency. *ScSoc*, 2: Nov. 13, 1915, 713-718.
164. Boston, Department of Educational Investigation and Measurement, English: determining a standard in accurate copying. *Bulletin No. 6, School Document No. 2*, 1916, pp. 25.
165. Breed, F. S. and Frostic, F. W. Measuring English composition in the sixth grade. *ElScJ*, 17: Jan., 1917, 307-325.
166. Brownell, B. A test of the Ballou scale of English composition. *ScSoc*, 4: Dec. 16, 1916, 938-942.
167. Brownell, B. A criticism of recent attempts to measure language ability. *ScR*, 25: Sept., 1917, 495-503.
168. Earhart, G. and Small, J. English in the elementary school. *ElScJ*, 16: Sept., 1915, 32-48.
169. Faust, W. G. An effort to standardize descriptive theme-writing for the senior year of the high school. *EngJ*, 5: April, 1916, 257-271.
170. Green, J. A. Minimum essentials in elementary-school subjects: English. *JEPd*, 3: Dec., 1916, 380-383.
171. Hillegas, M. B. *Scale for English Composition by Young People*. New York City.

172. Hillegas, M. B. A scale for the measurement of quality in English composition by young people. *TchCollRec*, 13: Sept., 1912, 331-384.
173. Hillegas, M. B. *A Scale for the Measurement of English Composition by Young People*. New York City, pp. 60.
174. Hosie, J. F. The essentials of composition and grammar. *ScSoc*, 1: April 24, 1915, 581-587; also in *Fourteenth YbNaSoc, Pt. I*, 1915, 90-115.
175. Hudelson, E. Standards and measurements in English composition. *Second IndianaConfMes*, 13: 1915, 115-122.
176. Hudelson, E. Some achievements in the establishment of a standard for the measurement of English in the Bloomington, Indiana, schools. *EngJ*, 5: Nov., 1916, 590-597.
177. Jenkins, F. A test of the ability of children to use language forms. *JEdPs*, 6: June, 1915, 335-344.
178. Johnson, F. W. The Hillegas-Thorndike scale for the measurement of quality in English composition. *ScR*, 21: Jan., 1913, 39-49.
179. Johnson, R. I. The persistency of error in English composition. *ScR*, 25: Oct., 1917, 555-580.
180. Jones, R. G. Standard vocabulary. *Fourteenth YbNaSoc, Pt. I*, 1915, 37-43.
181. Kayfetz, I. A critical study of the Hillegas composition scale. *PdSe*, 21: Dec., 1914, 559-577.
182. Kayfetz, I. A critical study of the Harvard-Newton composition scales. *PdSe*, 23: Sept., 1916, 325-347.
183. Kelley, T. L. Individual testing with completion-test exercises. *TchCollRec*, 18: Sept., 1917, 371-382.
184. Kirkpatrick, E. A. A vocabulary test. *PopSciM*, 70: Feb., 1907, 157-164.
185. Noyes, E. C. and Miller, Edith. Progress in standardizing the measurement of composition. *EngJ*, 1: Nov., 1912, 532-536.
186. Reynolds, G. F. For minimum standards in English. *EngJ*, 4: June, 1915, 349-356.
187. Rice, J. M. Educational research: the results of a test in language; and English, the need of a new basis in education. *The Forum*, 35: Oct., 1903, 269-293 and March, 1904, 440-457. Reprinted in *Scientific Management in Education*, New York, 1913.
188. Sackett, L. W. Comparable measures of composition. *ScSoc*, 5: Feb. 24, 1917, 233-239.
189. Sears, Isabel and Diebel, Amelia. A study of the common mistakes in pupils' oral English. *ElScJ*, 17: Sept., 1916, 44-54.
190. Starch, D. and Elliott, E. C. Reliability of grading high-school work in English. *ScR*, 20: Sept., 1912, 442-457.
191. Stark, W. E. Measurement of eighth-grade composition. *ScSoc*, 2: Aug. 7, 1915, 208-216.
192. Stoddard, W. E. A comparison of the Hillegas and Harvard-Newton scales in English composition. *PdSe*, 23: Dec., 1916, 498-501.
193. Thompson, T. E. *Thompson's Minimum Essentials in Language*. Monrovia, Calif.
194. Thorndike, E. L. A scale for measuring the merit of English writing. *Sci*, 33: June 16, 1911, 935-938.
195. Thorndike, E. L. A scale for merit in English writing by young people. *JEdPs*, 2: 1911, 361-368.
196. Thorndike, E. L. *Preliminary Extension to the Hillegas Scale*. New York City.

197. Thorndike, E. L. *English Composition: 150 Specimens Arranged for Use in Psychological and Educational Experiments*. New York City.
198. Thorndike, E. L. Notes on the significance and use of the Hillegas scale for measuring the quality of English composition. *EngJ*, 2: Nov., 1913, 551-561.
199. Trabue, M. R. Some results of a graded series of completion tests. *ScSoc*, 1: April 10, 1915, 537-540.
200. Trabue, M. R. *Language Scales*. New York City.
201. Trabue, M. R. Completion tests for public-school use. *Fifteenth YbNaSoc*, Pt. I, 1916, 52-59.
202. Trabue, M. R. *Completion-Test Language Scales*. New York City, pp. 119.
203. Trabue, M. R. Supplementing the Hillegas scale. *TchCollRec*, 18: Jan., 1917, 51-84.
204. Trabue, M. R. *Nassau County Supplement to the Hillegas Scale*. New York City.
205. Ward, C. H. The scale illusion. *EngJ*, 6: April, 1917, 221-230.
206. Willing, M. H. Scale for measuring written composition. *KansasBurMes*.
207. Wolfe, C. S. The Topeka scale for judging compositions. *Illinois Association of Teachers of English Bulletin*, 9: No. 6: March 1, 1917, 1-12.

English Grammar

208. Betz, Annette and Marshall, Esther. Grammar based on errors. *EngJ*, 5: Sept., 1916, 491-500.
209. Charters, W. W. Minimal essentials in elementary language and grammar. *Sixteenth YbNaSoc*, Pt. I, 1917, 85-110.
210. Charters, W. W. and Miller, Edith. A course of study in grammar: based upon the grammatical errors of school children of Kansas City, Missouri. *University of Missouri Bulletin*, 16: No. 2: *Education Series* 9, Jan., 1915, pp. 45.
211. Maxwell, W. H. Report of the committee on tests and standards of efficiency in schools and school systems: English grammar. *ProcNaEdAs*: 1915, 565-573.
212. Rapeer, L. W. The problem of formal grammar in elementary education. *JEdPs*, 4: March, 1913, 125-137.
213. Starch, D. *Starch's English Grammar Tests*. Madison, Wis.
214. Starch, D. The measurement of achievement in English grammar. *JEdPs*, 6: Dec., 1915, 615-626.

French

215. Starch, D. *French Vocabulary and Reading Tests*. Madison, Wis.

Geography

216. Boston, Department of Educational Investigation and Measurement. Geography: a report on a preliminary attempt to measure some educational results. *Bulletin No. 5, School Document No. 14*, 1915, pp. 38.
217. Bagley, W. C. The determination of minimum essentials in elementary geography and history. *Fourteenth YbNaSoc*, Pt. I, 1915, 131-146.
218. Hahn, H. H. and Lackey, E. E. *Hahn-Lackey Geography Scale*. Wayne, Neb.
219. Starch, D. *Starch's Geography Test*. Madison, Wis.

220. Thompson, T. E. *Thompson's Minimum Essentials in Geography*. Monrovia, Calif.
221. Witham, E. C. A minimum standard for measuring geography. *AmScBdJ*, 1: Jan., 1915, 13-14.

Geometry

222. Metzler, W. H. Problems in the experimental pedagogy of geometry. *JEdPs*, 3: Dec., 1912, 545-560.
223. Stockard, L. V. and Bell, J. C. A preliminary study of the measurements of abilities in geometry. *JEdPs*, 7: Dec., 1916, 567-580.

German

224. Starch, D. *German Vocabulary and Reading Tests*. Madison, Wis.

Handwriting

225. Ashbaugh, E. J. Handwriting of the Iowa state children. *Extension Division Bulletin No. 15, University of Iowa*, March 1, 1916, pp. 24.
226. Ayres, L. P. *A Scale for Measuring the Quality of Handwriting of School Children*. "Three Slant Edition." New York City, 1912.
227. Ayres, L. P. *A Scale for Measuring the Quality of Handwriting of School Children*. Russell Sage Foundation, Bulletin E 113, 1912, pp. 16.
228. Ayres, L. P. *A Scale for Measuring the Quality of Handwriting of Adults*. New York City.
229. Ayres, L. P. *A Scale for Measuring the Quality of Handwriting of Adults*. Russell Sage Foundation E 138, pp. 11.
230. Ayres, L. P. *A Measuring Scale for Handwriting: "Gettysburg Edition."* New York City.
231. Boston, Department of Educational Investigation and Measurement. Penmanship. Determining the achievement of elementary school graduates in handwriting. *Bulletin No. 9, School Document No. 6*, 1916, pp. 43.
232. Breed, F. S. and Culp, V. An application and critique of the Ayres' handwriting scale. *ScSoc*, 2: Oct. 30, 1915, 639-647.
233. Breed, F. S. and Culp, V. Note on the relation of legibility and form in handwriting. *ScSoc*, 4: Dec. 2, 1916, 870-872.
234. Breed, F. S. and Down, E. F. Measuring and standardizing handwriting in a school system. *ElScJ*, 17: March, 1917, 470-484.
235. Courtis, S. A. *Courtis Standard Research Tests. Handwriting. Series W*. Detroit, Mich.
236. Freeman, F. N. *Freeman's Handwriting Scale*. Chicago, Ill.
237. Freeman, F. N. Some practical studies of handwriting. *ElScJ*, 14: Dec., 1913, 167-179.
238. Freeman, F. N. *The Teaching of Handwriting*. Boston, 1914, pp. 155.
239. Freeman, F. W. Handwriting. *Fourteenth YbNaSoc, Pt. I*, 1915, 61-77.
240. Freeman, F. N. An analytical scale for judging handwriting. *ElScJ*, 15: April, 1915, 432-441.
241. Freeman, F. N. Handwriting tests for use in school surveys. *ElScJ*, 16: Feb., 1916, 299-301.
242. Freeman, F. N. Handwriting. *Sixteenth YbNaSoc, Pt. I*, 1917, 60-72.
243. Graves, S. M. A study in handwriting. *JEdPs*, 7: Oct., 1916, 483-494.
244. Gray, T. C. The training of judgment in the use of the Ayres scale for handwriting. *JEdPs*, 6: Feb., 1915, 85-98.

245. Gray, T. C. A score card for the measurement of handwriting. *Bulletin of the University of Texas*, No. 37, 1915, pp. 50.
246. Harris, J. H. and Anderson, H. W. A study of handwriting in the public schools of Dubuque, Iowa. *Bureau of School Measurements*, Dubuque, 1916, pp. 10.
247. Johnson, G. L. and Stone, C. R. Measuring the quality of handwriting. *ElScJ*, 16: Feb., 1916, 302-315.
248. Johnson, J. H. A comparison of the Ayres and Thorndike handwriting scales (containing a table of equivalent values in the two scales). *North Carolina High-School Bulletin*, 7: Oct., 1916, 170-173.
- 248a. Kansas City, Mo. *Writing Scale*. Bureau of Research and Efficiency, Dec., 1917.
249. King, I. and Johnson, H. The writing abilities of the elementary and grammar-school pupils of a city system measured by the Ayres scale. *JEdPs*, 3: Nov., 1912, 514-520.
250. King, I. and Newcomb, R. E. Improvement in handwriting. *EdAdm*, 2: Oct., 1916, 493-502.
251. Lewis, E. E. The present standard of handwriting in Iowa training high schools. *EdAdm*, 1: Dec., 1915, 663-671.
252. Manuel, H. T. The use of an objective scale in grading handwriting (results of a study of the Ayres scale). *ElScJ*, 15: Jan., 1915, 269-278.
253. Manuel, H. T. Studies in handwriting. *ScSoc*, 5: March 17, 1917, 327-330.
254. Montgomery, L. J. Writing test. *Educator Journal*, 14: May, 1914, 479-483.
255. Nutt, H. W. Rhythm in handwriting. *ElScJ*, 17: Feb., 1917, 432-445.
256. Pintner, R. A comparison of the Ayres and Thorndike handwriting scales. *JEdPs*, 5: Nov., 1914, 525-536.
257. Rusk, R. R. A class experiment in scoring handwriting. *PEdPs*, 5: Sept., 1914, 417-418.
258. Sackett, L. W. Comparable measures of handwriting. *ScSoc*, 4: Oct., 21, 1916, 640-645.
259. Starch, D. The measurement of handwriting. *JEdPs*, 4: Oct., 1913, 445-464.
260. Starch, D. The measurement of efficiency in writing. *JEdPs*, 6: Feb., 1915, 106-114.
261. Thompson, Mary E. Psychology and pedagogy of writing. Baltimore, 1911, pp. 128.
262. Thorndike, E. L. Means of measuring school achievements in handwriting. *EdAdm*, 1: May, 1915, 300-305.
263. Thorndike, E. L. Handwriting. *TchCollRec*, 2: March, 1910, 1-93.
264. Thorndike, E. L. *Handwriting Scale for Grades 5 to 8*. New York City.
265. Thorndike, E. L. *Handwriting*. New York City, pp. 41.
266. Thorndike, E. L. Teachers' estimates of the quality of specimens of handwriting. *TchCollRec*, 15: Nov., 1914, 279-291.
267. Wilson, G. M. The handwriting of school children. *ElScTch*, 11: June, 1911, 540-543.
268. Witham, E. C. All the elements of handwriting measured. *EdAdm*, 1: May, 1915, 313-324.
269. Witham, E. C. A method of measuring handwriting. *AmScBdJ*, 48: May, 1914, 18-19 and 72-73.

History

- 270. Bell, J. C. and McCollum, D. F. A study of the attainments of pupils in United States History. *JEdPs*, 8: May, 1917, 257-274.
- 271. Foster, H. D. Adequate tests in history. *History Teacher's Magazine*, 5: April, 1914, 116-123.
- 272. Myers, G. C. Delayed recall in history. *JEdPs*, 8: May, 1917, 275-283.
- 273. Sackett, L. W. A scale in ancient history. *JEdPs*, 8: May, 1917, 284-293.
- 274. Starch, D. *Starch's American History Test. Series A.* Madison, Wis.
- 275. Starch, D. and Elliott, E. C. Reliability of grading work in history. *ScR*, 21: Dec., 1913, 676-681.

Latin

- 276. Brown, H. A. *Brown's Connected-Latin Test, Latin-Sentence Test, Latin-Grammar Test, and Latin-Vocabulary Test.* Oshkosh, Wis.
- 277. Brown, H. A. A study of ability in Latin. *Bulletin No. 2. Bureau of Research, New Hampshire Dept. of the Public Instruction, Concord, N. H.* (Published at State Normal School, Oshkosh, Wis.)
- 278. Hanus, P. H. Measuring progress in learning Latin. *ScR*, 24: May, 1916, 342-351.
- 279. Henmon, V. A. C. *Vocabulary and Translation Tests for Latin.* Madison, Wis.
- 279a. Henmon, V. A. C. The measurement of ability in Latin. Part I, Vocabulary. *JEdPs*, 8: Nov., 1917, 515-538.
- 280. Starch, D. *Latin Vocabulary and Reading Tests.* Madison, Wis.

Physics

- 281. Starch, D. *Test for Physics.* Madison, Wis.

Reading

- 282. Ballard, P. B. Norms of performance in reading. *JEPd*, 3: Dec., 1915, 153-161.
- 283. Bell, J. C. and Sweet, Itasca B. The reading interests of high-school pupils. *JEdPs*, 7: Jan., 1916, 39-45.
- 284. Boston, Department of Educational Investigation and Measurement. Standards in silent reading, with suggestions on how teachers may test their pupils in silent reading. *Bulletin No. 12, School Document No. 18*, 1916, pp. 24.
- 285. Bowden, Josephine. Learning to read. *ElScTch*, 12: Sept., 1911, 21-33.
- 286. Brown, H. A. The measurement of the efficiency of instruction in reading. *ElScTch*, 14: June, 1914, 477-490.
- 287. Brown, H. A. The measurement of ability to read. *New Hampshire Department of Public Instruction Bureau of Research, Bulletin No. 1*, pp. 57.
- 288. Brown, H. A. The significance of the measurement of ability to read. *Ed*, 36: May, 1916, 589-610.
- 289. Brown, H. A. *Brown's Silent Reading Test.* Oshkosh, Wis.
- 290. Childs, H. G. A half-year's progress in the achievement of one school system as measured by the Thorndike visual vocabulary test. *Fifteenth YbNaSoc, Pt. I*, 1916, 79-83.
- 291. Courtis, S. A. Standard tests in English. *ElScTch*, 14: April, 1914, 374-392.

292. Courtis, S. A. Standards in rates of reading. *Fourteenth YbNaSoc*, Pt. I, 1915, 44-58.
293. Courtis, S. A. The problem of measuring ability in silent reading. *AmScBdJ*, 54: May, 1917, 17-18, 81.
294. Courtis, S. A. *Courtis Standard Tests, Silent Reading, Test No. 2*. Detroit, Mich.
295. Gray, C. T. Types of reading ability as exhibited through tests and laboratory experiments. *Supplementary Educational Monographs*, 1, No. 5: Aug. 29, 1917, pp. 196. Chicago, Ill.
296. Gray, W. S. Selected bibliography upon practical tests of reading ability. *Fourteenth YbNaSoc*, Pt. I, 1915, 59-60.
297. Gray, W. S. Methods of testing reading. *ElScJ*, 16: Jan., 1916, 231-246 and Feb., 1916, 281-298.
298. Gray, W. S. *Gray's Reading Tests: Silent and Oral*. Chicago, Ill.
299. Gray, W. S. A study of the emphasis on various phases of reading instruction in two cities. *ElScJ*, 17: Nov., 1916, 178-186.
- 299a. Gray, W. S. A cooperative study in reading in eleven cities in northern Illinois. *ElScJ*, 17: Dec., 1916, 250-265.
300. Gray, W. S. The relation of silent reading to economy in education. *Sixteenth YbNaSoc*, Pt. I, 1917, 17-32.
- 300a. Gray, W. S. Studies of elementary school reading through standardized tests. *Supplementary Educational Monographs*, Chicago, 1917. No. 1, pp. 157.
301. Haggerty, M. E. Scales for reading vocabulary of primary children. *ElScJ*, 17: Oct., 1916, 106-115.
302. Haggerty, M. E. The ability to read: its measurement and some factors conditioning it. *IndianaUnSd*, 4: Jan., 1917, pp. 63.
303. Haggerty, M. E. *Visual Vocabulary Scale and Reading Tests for the Understanding of Sentences*. University of Minnesota, Minneapolis, Minn.
304. Haggerty, M. E. and Thomas, J. M. The reading attainments of collegio freshmen. *ScSoc*, 6: Aug. 25, 1917, 230-238.
305. Harris, J. H. and Anderson, H. W. Measuring primary reading in the Dubuque schools. Dubuque, 1916, pp. 23.
306. Hendricks, E. L. *A preliminary Report of a Study in Reading*. New York, 1911. pp. 30.
307. Hill, D. S. Experimental studies of achievement in reading. *Annual Report of the New Orleans Public Schools*, 1915-16, Pt. 3, 61-72.
308. Jones, R. G. *Jones' Scale for Teaching and Testing Elementary Reading*. Rockford, Ill.
309. Judd, C. H. Reading tests. *ElScTch*, 14: April, 1914, 365-373.
310. Judd, C. H. Report of the committee on tests and standards of efficiency in schools and school systems: reading tests. *ProcNaEdAs*: 1915, 561-565.
311. Judd, C. H. Reading. *Fifteenth YbNaSoc*, Pt. I, 1916, 111-119.
312. Kansas State Normal School, Bureau of Educational Measurements and Standards. *Standardized Tests in Silent Reading*. Emporia, Kan.
313. Kelley, T. L. Thorndike's reading scale Alpha 2 adapted to individual testing. *TchCollRec*, 18: May, 1917, 253-260.
314. Kelly, F. J. The Kansas silent reading test. *KansasBurMes*, 3: *New Series*, 4: 1915, pp. 37.
315. Kelly, F. J. The Kansas silent reading tests. *JEDPs*, 7: Feb., 1916, 63-80.
316. King, I. A comparison of slow and rapid readers. *ScSoc*, 4: Nov. 25, 1916, 830-834.

317. King, I. Comparison of the efficiency of slow and rapid readers. *ScSoc*, 6: Aug. 18, 1917, 203-204.
318. Llewelyn, E. J. Reading in the Mount Vernon, Indiana, city schools. *ElScJ*, 17: Oct., 1916, 123-127.
319. Lodge, R. C. and Jackson, J. L. Reproduction of prose passages. *PsCl*, 10: Oct., 1916, 128-145.
320. McGinnis, W. C. Reading. *Journal of Education*, 86: Sept. 6, 1917, 207-208.
321. Mead, C. D. Silent versus oral reading with one hundred sixth-grade children. *JEdPs*, 6: June, 1915, 345-348.
- 321a. Monroe, W. S. A report on the use of the Kansas Silent Reading tests with over one hundred thousand children. *JEdPs*, 8: 1917.
322. Moore, E. C. An experiment in teaching college students how to study. *ScSoc*, 2: July 17, 1915, 100-107.
323. Oberholzer, E. E. Testing the efficiency of reading in the grades. *ElScJ*, 15: Feb., 1915, 313-322.
324. Oberholzer, E. E. The effects of efficiency tests in reading on a city school system. *Fifteenth YbNaSoc*, Pt. I, 1916, 138-140.
325. Otis, A. S. Considerations concerning the making of a scale for the measurement of reading ability. *PdSe*, 23: Dec., 1916, 528-549.
326. Peters, C. C. The influence of speed drills upon the rate and effectiveness of silent reading. *JEdPs*, 8: June, 1917, 350-366.
327. Pintner, R. Oral and silent reading of fourth-grade pupils. *JEdPs*, 4: June, 1913, 333-337.
328. Pintner, R. and Gilliland, A. R. Oral and silent reading. *JEdPs*, 7: April, 1916, 201-212.
329. Richards, Alva M. and Davidson, P. E. Correlations of single measures of some representative reading tests. *ScSoc*, 4: Sept. 2, 1916, 375-377.
330. Schmidt, W. A. An experimental study in the psychology of reading. *Supplementary Educational Monographs*, 1: No. 2, April, 1917, pp. 126. Chicago.
331. Schmitt, Clara. School subjects as materials for tests of mental ability. *ElScJ*, 15: Nov., 1914, 150-161.
332. Starch, D. *Starch's Silent Reading Tests*. Madison, Wis.
333. Starch, D. The measurement of efficiency in reading. *JEdPs*, 6: Jan., 1915, 1-24.
334. Starch, D. *Starch's English Reading Vocabulary Test*. Madison, Wis.
335. Thorndike, E. L. The measurement of ability in reading. *TchCollRec*, 15: Sept., 1914, 207-277.
336. Thorndike, E. L. Tests of oral and silent reading. *IndianaUnBu* 12: 1914, 37-51.
337. Thorndike, E. L. *Thorndike's Visual Vocabulary Reading Test*. New York City.
338. Thorndike, E. L. *Thorndike's Scale Alpha for Measuring the Understanding of Sentences*. New York City.
339. Thorndike, E. L. *Improved Scale for Measuring the Understanding of Sentences: Scale Alpha 2, Parts 1 and 2*. New York City.
340. Thorndike, E. L. An improved scale for measuring ability in reading. *TchCollRec*, 16: Nov., 1915, 31-53; and 17: Jan., 1916, 40-67.
341. Thorndike, E. L. *Improved Scale for Word Knowledge or Visual Vocabulary: Scale A 2 and Scale B*. New York City.
342. Thorndike, E. L. Measurement of achievement in reading: word knowledge. *TchCollRec*, 17: Nov., 1916, 430-454.
343. Thorndike, E. L. Reading as reasoning: A study of mistakes in paragraph reading. *JEdPs*, 8: June, 1917, 323-332.

344. Thorndike, E. L. The understanding of sentences: a study of errors in reading. *ElScJ*, 18: Oct., 1917, 98-114.
345. Uhl, W. L. The use of the results of reading tests as a basis for planning remedial work. *ElScJ*, 17: Dec., 1916, 266-275.
346. Waldo, K. D. Tests in reading in Sycamore schools. *ElScJ*, 15: Jan., 1915, 251-268.
347. Wassen, A. W. Report of an experiment in the use of the Kansas silent reading test with Korean students. *EdAdm*, 3: Feb., 1917, 98-101.
348. Whipple, G. M. and Curtis, Josephine N. Preliminary investigation of skimming in reading. *JEdPs*, 8: June, 1917, 333-349.
349. Whitney, F. L. Measuring the value of first-grade readers. *AmScBdJ*, 53: Sept., 1916, 24 and 77-78.
350. Zeidler, R. Tests in silent reading in the rural schools of Santa Clara County, California. *ElScJ*, 17: Sept., 1916, 55-62.

Spanish

- 350a. Lewis, E. E. Tentative vocabulary tests for first-year Spanish. *Midland Schools*, 32: Sept., 1917, 6-8.

Spelling

351. Ayres, L. P. *A Measuring Scale for Ability in Spelling*. New York City.
352. Ayres, L. P. *A Measuring Scale for Ability in Spelling*. Bulletin E139, New York City, pp. 56.
353. Ballou, F. W. Measuring Boston's spelling ability by the Ayres spelling scale. *ScSoc*, 5: March 3, 1917, 267-270.
354. Bauer, N. *The Writing Vocabulary of Pupils of the New Orleans Public Schools*. Department of Superintendence, New Orleans, 1915.
355. Boston, Department of Educational Investigation and Measurement. Provisional minimum and supplementary lists of spelling words for pupils in Grades 1 to 8. *Bulletin No. 1, School Document No. 8*: 1914, pp. 48.
356. Boston, Department of Educational Investigation and Measurement. Spelling. Determining the degree of difficulty of spelling words. *Bulletin No. 4, School Document No. 10*: 1915, pp. 48.
357. Boston, Department of Educational Investigation and Measurement. Spelling: the teaching of spelling. *Bulletin No. 11, School Document No. 17*: 1916, pp. 21.
358. Buckingham, B. R. Spelling ability: its measurement and distribution. *TchCollConEd*, 59: 1913, pp. 116.
359. Burnham, W. H. Hygiene and psychology of spelling. *PdSe*, 13: Dec., 1906, 474-501.
360. Cook, W. A. and O'Shea, M. V. *The Child and his Spelling*. Indianapolis, 1914, pp. 282.
361. Cornman, O. P. *Spelling in the Elementary School: an Experimental and Statistical Investigation*. Boston, 1902, pp. 98.
362. Curtis, S. A. *Teaching Spelling by Plays and Games*. Detroit, 1917, pp. 48.
363. Foster, F. M. The results of a recent spelling test at the University of Iowa. *ScSoc*, 5: April 28, 1917, 506-508.
364. Foster, W. T. The spelling of college students. *JEdPs*, 2: 1911, 211-215.
365. Gregory, B. C. The rationals of spelling. *ScHomeEd*, 27: Nov., 1907, 84-92, Dec., 1907, 123-129; also *ElScTch*, 8: Sept., 1907, 40-55.

366. Grupe, Mary A. A review of the pedagogical studies in the teaching of spelling. *Ed*, 34: Sept., 1913, 1-19.
367. Hill, D. S. Experimental studies in achievement in spelling. *Annual Report of the New Orleans Public Schools*, 1915-16, Pt. 3, 39-59.
368. Houser, J. D. The relation of spelling ability to general intelligence and to meaning vocabulary. *ElScJ*, 16: Dec., 1915, 190-199.
369. Houser, J. D. An investigation of the writing vocabularies of representatives of an economic class. *ElScJ*, 17: June, 1917, 708-718.
370. Jones, W. F. *Concrete Investigation of the Material of English Spelling*. Vermillion, S. Dak., 1914, pp. 27.
- 370a. Kansas City, Mo. *Preliminary Report of the Committee on Spelling*. Research Bulletin No. 2, 1916. pp. 47.
371. Lewis, E. E. Testing the spelling abilities of Iowa school children by the Buckingham spelling tests. *ElScJ*, 16: June, 1916, 556-564.
372. McFarland, W. H. Relation between spelling judgment and spelling ability. *Midland Schools*, 31: Sept., 1916, 19-21.
373. Monroe, W. *A Timed-Sentence Spelling Test*. KansasBurMes: Emporia Kan.
374. Otis, A. S. The reliability of spelling scales, involving a "deviation formula" for correlation. *ScSoc*, 4: Oct. 28, Nov. 4, 11, and 18, 1916, 677-683, 716-722, 750-756, and 793-796.
375. Pearson, H. C. The scientific study of the teaching of spelling. *JEdPs*, 2: 1911, 241-252.
376. Pryor, H. C. Spelling. *Fourteenth YbNaSoc*, Pt. I, 1915, 78-89.
377. Pryor, H. C. A suggested minimal spelling list. *Sixteenth YbNaSoc*, Pt. I, 1917, 73-84.
378. Rice, J. M. The futility of the spelling grind. *The Forum*, 23: Mar.-Aug., 1897, 163-172, 409-419. Reprinted in *Scientific Management in Education*, New York, 1913.
379. Sackett, L. W. Measuring a school system by the Buckingham spelling scale. *ScSoc*, 2: Dec. 11 and 18, 1915, 860-864 and 894-898.
380. Sackett, L. W. Disparity of spelling scales. *JEdPs*, 6: Dec., 1915, 627-630.
381. Scofield, F. A. Difficulty of Ayres' spelling scale as shown by the spelling of 560 high-school students. *ScSoc*, 4: Aug. 26, 1916, 339-340.
382. Scofield, F. A. An experiment in spelling in the Eugene High School. *ScSoc*, 5: March 10, 1917, 299-300.
383. Sears, J. B. Spelling efficiency in the Oakland schools. *ScSoc*, 2: Oct. 9 and 16, 1915, 531-537 and 569-574. Full report in *Board of Education Bulletin No. 9*: 1915, Oakland, Cal., pp. 79.
384. Starch, D. The measurement of efficiency in spelling and the overlapping of grades in combined measurements of reading, writing, and spelling. *JEdPs*, 6: March, 1915, 167-186.
385. Studebaker, J. W. *Results of an Investigation of Pupils' Ability to Spell*. Boston, 1916, pp. 57.
386. Suzzalo, H. The teaching of spelling. *TchCollRec*, 12: Nov., 1911, 259-330.
387. Suzzalo, H. *The Teaching of Spelling*. Boston, 1913, pp. 129.
388. Suzzalo, H. and Pearson, H. C. Comparative experimental teaching of spelling. *TchCollRec*, 13: Jan., 1912, 1-66.
389. Thorndike, E. L. Means of measuring school achievements in spelling. *EdAm*, 1: May, 1915, 306-312.
390. Tidyman, W. F. A critical study of Rice's investigation of spelling efficiency. *PdSe*, 22: Sept., 1915, 391-400.

391. Tidyman, W. F. A descriptive and critical study of Buckingham's investigation of spelling efficiency. *EdAdm*, 2: May, 1916, 290-304.
392. Wallin, J. E. W. *Spelling Efficiency in Relation to Age, Grade, and Sex, and the Question of Transfer*. Baltimore, 1911, pp. 91.

DIVISION C

GENERAL REPORTS ON THE USE OF TESTS AND SCALES IN SCHOOLS

393. Ballou, F. W. Report of department of educational investigation and measurement. *Annual Report Superintendent of Schools Boston, School Document No. 17*, 1915, 84-118.
394. Ballou, F. W. Work of the department of educational investigation and measurement, Boston. *Fifteenth YbNaSoc, Pt. I*, 1916, 61-68.
395. Bobbitt, F. B. The work of the schools. Elementary schools. *Report of the School Survey of Denver, Col., Pt. 2*, 1916, 59-74.
- 395a. Bronner, Augusta F. *The Psychology of Special Abilities and Disabilities*. Boston, 1917. pp. 269.
396. Brown, G. A. Helps from the use of standard scales of attainment in school subjects. *ScHomeEd*, 33: April, 1914, 300-302.
- 396a. Chapman, J. C. and Feder, R. B. The effect of external incentives and improvement. *JEdPs*, 8: Oct., 1917, 469.
- 396b. Comin, R. Teachers' estimates of the ability of pupils. *ScSoc*, 3: Jan. 8, 1916, 67.
397. Courtis, S. A. *Courtis Standard Research Tests. Sixth Annual Accounting*. Also *Standard Scores in Silent Reading*. Detroit, 1917.
398. Courtis, S. A. Better teaching in arithmetic. *Proc. Harvard Teachers' Association*, 1913.
- 398a. Courtis, S. A. Measurement of the relation between physical and mental growth. *Amer. Phys. Educ. Rev.* 22: Nov., 1917.
399. Cubberley, E. P. Use of standard tests at Salt Lake City, Utah. *Fifteenth YbNaSoc, Pt. I*, 1916, 107-110.
400. Elliott, C. H. Variation in the achievements of pupils. A study of the achievements of pupils in the fifth and seventh grades, and in classes of different sizes. *TchCollConEd*, 72: 1914, pp. 114.
401. Haggerty, M. E. Elementary teachers and co-operative research. *IndianaUnBu*, 12: 1914, 94-110.
402. Harlan, C. L. A comparison of the writing, spelling, and arithmetic abilities of country and city children. *EdAdm*, 2: Nov., 1916, 560-572.
403. Judd, C. H. *Measuring the Work of the Public Schools*. The Survey Committee of the Cleveland Foundation, Cleveland, Ohio, 1916, pp. 290.
404. Kansas City, Mo., Bureau of Research and Efficiency, Public Schools. *Bulletin No. 1*, Feb., 1916.
405. Kansas State Normal School. Bureau of Educational Measurements and Standards. Second and third annual reports, 1915-16 and 1916-17. *Study No. 6, New Series*, 6, No. 7. Emporia, Kansas.
406. Melcher, G. Studies by the bureau of research and efficiency of Kansas City, Mo. *Fiftcenth YbNaSoc, Pt. I*, 1916, 120-137.
407. Monroe, W. S. A teacher's handbook of educational measurements. *KansasBurMes*. 5: Emporia, Kan.
408. Monroe, W. S. *Educational Tests and Measurements*. New York City, 1917. pp. 309.
409. Morrison, J. C. The supervisor's use of standard tests of efficiency. *ElScJ*, 17: Jan., 1917, 335-354.
410. Sears, J. B. The efficiency of the instruction measured. *Report of a Survey of the School System of Salt Lake City, Utah*, 1915, 127-186.
411. Southington, Conn. *School Report*, 1917.

DIVISION D

LISTS OF TESTS AND SCALES

412. Alexander, C. List of investigations by members of the society of college teachers of education. *ScRMon*, 5: 1914, 73-82.
413. Chapman, J. C. and Rush, Grace P. *The Scientific Measurements of Classroom Products*. New York City, 1917, pp. 191.
414. Courtis, S. A. *A Manual of Instruction for Giving and Scoring the Courtis Standard Tests in the Three R's*. Detroit, 1914. pp. 128.
415. Cross, A. Weighing the scales. *EngJ*, 6: March, 1917, 183-191.
416. Gray, W. S. Descriptive list of standard tests. *ElScJ*, 17: Sept., 1916, 24-34.
417. Gray, W. S. Descriptive list of standard tests, 1917. *ElScJ*, 18: Sept. 1917, 56-70.
418. Holmes, H. W. and others. A descriptive bibliography of measurement in elementary subjects. *Harvard Bulletins in Education*, 5: June, 1917, pp. 43.
419. Johnston, J. H. A brief tabular history of the movement toward standardization by means of scales and tests of educational achievements in the elementary school subjects. *EdAdm*, 2: Oct., 1916, 483-492.
420. Knox, H. A. Measuring human intelligence. A progressive series of standardized tests used by the public health service to protect our racial stock. *Scientific American*, Jan. 9, 1915, 52-55.
421. Kohs, S. C. The Binet-Simon measuring scale for intelligence: an annotated bibliography. *JEdPs*, 5: April, May, and June, 1914, 215-224, 279-290, and 335-346.
422. Kohs, S. C. An annotated bibliography of recent literature on the Binet-Simon scale (1913-1917) Pt. I. *JEdPs*, 8: Sept. to Dec., 1917, 425-438, 488-502, 559-565, 609-618.
423. Manahan, J. L. (Compil.) A bibliography of educational surveys and tests. *University of Virginia Record Extension Series*, 2: Nov., 1916, 49-92.
424. Pyle, W. H. *The Examination of School Children. A Manual of Directions and Norms*. New York City, 1913. pp. 70.
425. Springer, I. (Ed.) Teachers' yearbook of educational investigations. *Division of Reference and Research, Bulletin No. 1*, Department of Education, New York City, 1914, pp. 12.
426. Springer, I. (Ed.) Teachers' yearbook of educational investigations. *Division of Reference and Research, Publication No. 6*, Department of Education, New York City, 1915, pp. 75.
427. Springer, I. (Ed.) Teachers' yearbook of educational investigations. *Division of Reference and Research, Publication No. 14*, Department of Education, New York City, 1916. pp. 53.
428. Starch, D. *The Measurement of Efficiency in Reading, Writing, Spelling, and English*. Madison, Wis. 1914.
429. Starch, D. *Educational Measurements*. New York City, 1916, pp. 202.
430. Strayer, G. D. Standards and tests for measuring the efficiency of schools or systems of schools. *U. S. Bureau of Education Bulletin*, No. 13, 1913, pp. 23.
- 430a. Whipple, G. M. *Manual of Mental and Physical Tests*. Baltimore, Md., 1915, pp. 702.

DIVISION E

CORRELATIONS BETWEEN ABILITIES

431. Buckingham, B. R. Correlation between ability to think and ability to remember, with special reference to United States history. *ScSoc*, 5: April 14, 1917, 443-449.
- 431a. Chapman, J. C. Individual differences in ability and improvement and their correlation. *TchCollConEd*, No. 63, 1914.
432. King, Irving. The relationship of abilities in certain mental tests to ability as estimated by teachers. *ScSoc*, 5: Feb. 17, 1917, 204-209.
433. McCall, W. A. Correlation of some psychological and educational measurements, with special attention to the measurement of mental ability. *TchCollConEd*, 79: 1916, pp. 87.
434. McCall, W. A. Correlation of some psychological and educational measurements; with special attention to the measurement of mental ability. *ScSoc*, 5: Jan. 6, 1917, 24-30.
435. Simpson, B. R. Correlation of mental abilities. *TchCollConEd*, 53: 1912, pp. 122.
436. Starch, D. Correlations among abilities in school studies. *JEdPs*, 4: Sept., 1913, 415-418.
437. Terman, L. M. A trial of mental and pedagogical tests in a civil service examination for policemen and firemen. *Journal of Applied Psychology*, 1: March, 1917, 17-29.
438. Wissler, C. The correlation of mental and physical tests. *PsR Psychological Review Monograph Supplement*, 3, No. 6: June, 1901, New York, pp. 62.
439. Woolley, Helen T. and Fischer, Charlotte R. Mental and physical measurement of working children; studies from the laboratory of the vocation bureau, Cincinnati, Ohio, 1914. *The Psychological Monographs*, 18, No. 1: Dec., 1914, pp. 247.

DIVISION F

TEACHER MEASUREMENT

440. Anderson, D. A. Methods of measuring teaching efficiency. *ScSoc*, 3: April 15, 1916, 556-562.
441. Anderson, W. N. The selection of teachers. *EdAdm*, 3: Feb., 1917, 83-90.
442. Boyce, A. C. Qualities of merit in secondary school teachers. *JEdPs*, 3: March, 1912, 144-157.
443. Boyce, A. C. Methods for measuring teachers' efficiency. *Fourteenth YbNaSoc*, Pt. 2, 1915, pp. 83.
444. Coffman, L. D. The rating of teachers in service. *ScRMon*, No. 5: 1914 13-24.
445. Elliott, E. C. *Outline of a Tentative Scheme for the Measurement of Teaching Efficiency*. Wisconsin State Department of Education. 1910. Leaflet.
446. Elliott, E. C. Provisional plan for the measure of merit of teachers. Wisconsin State Department of Education, 1914.
447. Elliott, E. C. Methods and standards for determining teaching efficiency and the rating of teaching efficiency in other cities. *City School Supervision*. Yonkers, N. Y., 1914, Chaps. 9 and 10, 116-117.

448. Elliott, E. C. How shall the efficiency of teachers be tested and recorded? *ProcNaEdAs*, 1915, 469-473. Also in *EdAdm*, 1: May, 1915, 291-299.
449. Fichandler, A. A study in self-appraisal. *ScSoc*, 4: Dec. 30, 1916, 1000-1002.
450. Heffelfinger, J. B. The question as to the factor in teaching. *Tch*, 1, No. 10. State Normal School, Emporia, Kans.
451. Johnston, J. H. Teacher rating in large cities. *ScR*, 24: Nov., 1916, 641-647.
452. Johnston, J. H. Scientific supervision of teaching. *ScSoc*, 5: Feb. 17, 1917, 181-188.
453. Jones, E. S. A suggestion for teacher measurement. *ScSoc*, 6: Sept. 15, 1917, 321-322.
454. Kilpatrick, W. H. The rating of prospective teachers. *ScRMon*, No. 5: 1914, pp. 12.
455. Pittenger, B. F. Problems of teacher measurement. *JEdPs*, 8: Feb., 1917, 103-110.
456. Shiels, A. The rating of teachers in the New York City public schools. *ScSoc*, 2: Nov. 20, 1915, 752-754.
457. Sprague, H. A. Score card for rating student-teachers in training and practice. *PdSe*, 23: March, 1917, 72-80.
458. Springer, I. (Ed.) Teaching efficiency. *Teachers' Yearbook of Educational Investigations*, Publication No. 14; Bureau of Reference and Research, Department of Education, New York City, 1916.
459. Taylor, J. S. Measurement of educational efficiency. *Educational Review*, 44: Nov., 1912, 348-367.
460. Turner, E. A. Standards employed in the determination of teaching efficiency. *Normal School Quarterly*, Series 14, No. 58: Jan., 1916, Normal, Ill. pp. 32.
461. Witham, E. C. School and teacher measurement. *JEdPs*, 5: May, 1914, 267-278.

DIVISION G

ARTICLES ABOUT SURVEYS AND LISTS OF SURVEYS

462. Allen, W. H. Contrasted methods of surveying higher education. *ScSoc*, 5: Feb. 10, 1917, 171-173.
463. Ayres, L. P. School surveys. *ScSoc*, 1: April 24, 1915, 577-581.
464. Ayres, L. P. A survey of school surveys. *Second IndianaConfMes*, 13: 1915, 172-181.
465. Bobbitt, J. F. The school survey: finding standards of current practice with which to measure one's own schools. *ElScJ*, 15: Sept., 1914, 41-54.
466. Buckingham, B. R. A survey of the Gary schools and the pre-vocational schools in New York City. *Third IndianaConfMes*, 2: 1917, 119-125.
467. Buchner, E. F. School surveys. *Report of the U. S. Commissioner of Education*, 1, chapt. 24; 1914.
468. Buchner, E. F. Educational surveys, 1916. *Report of the U. S. Commissioner of Education*, 1, chapt. 21, 1916.
469. Elliott, E. C. State school surveys. *AmScBdJ*, 48: March, 1914, 9-10, and 62.

470. Frost, N. A statistical study of the public schools of the southern Appalachian mountains. *United States Bureau of Education Bulletin* No. 11, 1915, pp. 71.
471. Koos, L. V. The fruits of school surveys. *ScSoc*, 5: Jan. 13, 1917, 35-41.
472. Mahoney, J. Some foreign educational surveys. *United States Bureau of Education, Bulletin* No. 37, 1915, pp. 39.
473. Pintner, R. A mental survey of the school population of a village. *ScSoc*, 5: May. 19, 1917, 597-600.
474. Righter, L. The educational survey preparatory to the organization of vocational education. *TchCollRec*, 14: January, 1913, 3-42.
475. Smith, H. L. and Judd, C. H. Plans for organizing school surveys with a summary of typical school surveys. *Thirteenth YbNaSoc*, Pt. 2, 1914, pp. 85.
476. Strayer, G. D., Kandel, I. L., and Alexander, C. Selected bibliography of recent school surveys. *ScRMon*, No. 5: 1914, 62-72.
477. Thomson, F. A. College and university surveys. *ScSoc*, 5: June 23, 1917, 721-728.
478. Van Sickle, J. H., Ayres, L. P., and others. The investigation of the efficiency of schools and school systems. *ProcNaEdAs*: 1915, 379-402.
479. Witham, E. C. School measurement. *JEdPs*, 5: Dec., 1914, 571-588.

DIVISION H

CITY SURVEYS

480. Ashland, O. Constructive survey of the public school system of Ashland, Oregon. By F. C. Ayer, C. R. Frazier, and D. C. Sowers. *University of Oregon Bulletin*, 12: 1915, pp. 52.
481. Atlanta, Ga. *Report of Survey of the Department of Education*. By S. G. Lindholm. Bureau of Municipal Research, New York, Dec., 1912, pp. 24.
482. Atlanta, Ga. *Survey of the Atlanta Public Schools*. By Miss C. S. Parrish. State School Department, Atlanta, May, 1914, pp. 33.
483. Baltimore, Md. Report of the Commission appointed to study the system of education in the public schools of Baltimore. *United States Bureau of Education Bulletin*, 4: 1911, pp. 112.
484. Blaine, Wash. A survey of the public schools. By H. G. Lull and others. *University Extension Journal*, 1: July, 1914, University of Washington, pp. 165.
485. Bloomington, Ind. A survey of a public school system. By H. L. Smith. *TchCollConEd*, 82: 1917, New York, pp. 304.
486. Boise, Idaho. *Report of C. N. Kendall, Commissioner of Education of New Jersey, on the Boise Public Schools*. Board of Education, Boise, December 18, 1910, pp. 31.
487. Boise, Idaho. *Expert Survey of Public School System, Boise, Idaho*. By E. C. Elliott, C. H. Judd, and G. D. Strayer. 1913, pp. 31.
488. Boise, Idaho. *Special Report of the Boise Public Schools*. Board of Education, Boise. June, 1915, pp. 96.
489. Boston, Mass. *Report on the Boston School System*. Finance Commission of the City of Boston. Boston, 1911, pp. 234.
490. Boston, Mass. Report of a study of certain phases of the public school system of Boston, Mass. *Finance Commission of the City of Boston, Document* 87: 1916, pp. 219.

491. Boston, Mass. *Report on the Boston School Department: with Especial Emphasis on the Need for a Reorganization of Its Central Administrative System.* Finance Commission of the City of Boston, 1916, pp. 66.
492. Bridgeport, Conn. *Report of the Examination of the School System of Bridgeport, Conn.* Conducted by James H. Van Sickle. Board of Education, Bridgeport, Conn., 1913, pp. 129.
493. Brookline, Mass. *Educational Survey of the Public Schools.* By J. H. Van Sickle and others. The School Committee, Brookline, Mass., 1917, pp. 436.
494. Brooklyn, N. Y. *Report upon Divisions 4 and 5, Elementary Schools.* By William McAndrew. Reprinted by the World Book Company, Yonkers, N. Y., under title *The Public Health and its School.* 1917. pp. 76.
495. Buffalo, N. Y. *Examination of the Public School System of the City of Buffalo.* University of the State of New York, Albany, N. Y., 1916, pp. 208.
496. Butte, Mont. *Report of a Survey of the School System of Butte, Mont.* Board of School Trustees, Butte, Mont., 1914, pp. 163.
497. Chicago, Ill. *Report of Educational Commission of Chicago.* University of Chicago Press, Chicago, Ill., 1900, pp. 248.
498. Chicago, Ill. *Survey of Chicago Public Schools.* By E. F. Young. Chicago, Ill., 1914, pp. 257.
499. Chicago, Ill. *Recommendations for Reorganization of the Public School System of Chicago.* City Council, Chicago, Ill., 1917, pp. 83.
500. Cleveland, Ohio. *Report of the Educational Commission Appointed by the Board of Education to Examine into the Government, Supervision and Course of Study of the Cleveland Public Schools.* Board of Education, Cleveland, Ohio, 1906, pp. 120.
501. Cleveland, Ohio. *The Three E's. Improvement in Them. Place in Present Course of Study, Cleveland Public Schools.* Board of Education, Cleveland, 1909, pp. 30.
502. Cleveland, Ohio. *The Cleveland Education Survey.* L. P. Ayres, director. Survey Committee of the Cleveland Foundation, Cleveland, 1915-1916. 25 vols.
503. Dansville, N. Y. *A Study of the Dansville High School.* By J. M. Foster. Board of Education, Dansville, N. Y., 1915, pp. 108.
504. Denver, Col. *Report of the School Survey of School District No. 1, in the City and County of Denver.* School Survey Committee, Denver, Col., 1916.
505. East Orange, N. J. *Report of the Examination of the School System of East Orange, New Jersey.* Board of Education, East Orange, N. J., 1912, pp. 64.
506. East Windsor, Conn. *Educational Enquiry.* State Board of Education, Hartford, Conn., 1916, pp. 34.
507. Evansville, Ind. *Report of the Evansville, Indiana, survey for vocational education.* C. H. Winslow, director. Indiana State Board of Education. *Educational Bulletin*, No. 19, Indianapolis, Jan. 1, 1917.
508. Framingham, Mass. *Survey of the Framingham Public Schools.* By G. D. Strayer and others. *Annual Report for 1916 of the Board of School Committee and of the Superintendent of Schools*, Framingham, Mass., 34-84.
509. Gary, Ind. *The public school system of Gary, Indiana.* By W. P. Burris. *U. S. Bureau of Education Bulletin*, No. 18: 1914, Washington, D. C., pp. 49.
510. Glastonbury, Conn. *Educational Enquiry.* State Board of Education, Hartford, Conn., 1916, pp. 37.

511. Grafton, W. Va. *Report of the Survey of the Grafton City Schools*. By J. N. Deahl and others. Department of Schools, Charleston, W. Va., 1913, pp. 29.
512. Grand Junction, Col. *A Survey of the City Schools of Grand Junction, Colorado, District No. 1, Mesa County*. Board of School Directors, Grand Junction, Col., May, 1916, pp. 64.
513. Grand Rapids, Mich. *A School Survey of Grand Rapids, Mich.* Board of Education, Grand Rapids, Mich. 1916, pp. 510.
514. Great Neck, Long Island. *The Great Neck School Survey*. By G. D. Strayer and M. G. Neale. Great Neck Association, Great Neck, L. I., 1917, pp. 30.
515. Greenwich, Conn. *Report of the Special Committee and Town School Committee of Greenwich, Conn., with Reference to the Needs of the Town as to Enlarged School Accommodations*. Greenwich, Dec., 1911, pp. 11.
516. Greenwich, Conn. *The Book of the Educational Exhibit of Greenwich, Conn.* Greenwich, 1912, pp. 24.
517. Hammond, Ind. *Some Facts Concerning the People, Industries and Schools of Hammond: and a Suggested Program for Elementary Industrial, Prevocational and Vocational Education*. By R. J. Leonard. University of Indiana, Bloomington, Ind.
518. Harrisburg, Pa. *Report on the High School Situation in Harrisburg, Pa.* By H. Snyder. Board of Education, Harrisburg, 1912, pp. 23.
- 518a. Harrisburg, Pa. *A Report upon the Business and Financial Administration of the Harrisburg School District*. Bureau of Municipal Research, New York City.
519. Indianapolis, Ind. Report of the Indianapolis, Indiana, survey for vocational education, vol. 1. *Indiana State Board of Education, Educational Bulletin No. 21*: Jan., 1917.
- 519a. Janesville, Wis. *An Educational Survey of Janesville, Wis.* State Department of Education, 1918.
520. Leavenworth, Kans. Report of a survey of the public schools of Leavenworth, Kansas. *Bureau of Educational Measurements and Standards. Kansas State Normal School New Series*, 4, No. 2: Emporia, Kans., 1915, pp. 202.
521. Los Angeles, Cal. *Report of the Advisory Committee to the Board of Education of the City of Los Angeles on Certain Aspects of the Organization and Administration of the Public School System*. Board of Education, Los Angeles, 1916, pp. 177.
522. Minneapolis, Minn. *A Vocational Survey of Minneapolis*. The Teachers' Club, Minneapolis, 1913, pp. 90.
523. Minneapolis, Minn. *A Series of Monographs on the Minneapolis Public Schools*. Board of Education, Minneapolis, Minn., 1916 and 1917.
524. Montclair, N. J. *Report on the Programme of Studies in the Public Schools of Montclair, N. J.* By P. H. Hanus. Cambridge, Mass., 1911, pp. 28.
525. Newburgh, N. Y. Public Schools. By F. Zeiger and Z. L. Potter. *The Newburgh Survey*: Russell Sage Foundation, New York, 1913, 5-20.
526. New Orleans, La. *Survey of Industries and Mechanical Occupations in New Orleans*. By the Division of Educational Research of the Public Schools. Summary of the report, *SeSoe*, 2: Sept. 18, 421-427; and Sept. 25, 1915, 461-466. Reprinted.
527. New York City, N. Y. *Final Report of Committee on School Inquiry, Board of Estimate and Apportionment*. The Committee, New York City, 1911-1913. 3 vols.

528. New York City, N. Y. *Outside Cooperation with the Public Schools of Greater New York; Report Submitted to the Board of Estimate's Committee on School Inquiry.* Abridged edition, Bureau of Municipal Research, New York, March, 1912, pp. 48.
529. New York City, N. Y. *A Digest of the New York School Inquiry.* Bureau of Municipal Research, New York City, 1913, pp. 68.
530. New York City, N. Y. *School Efficiency. A Constructive Study Applied to New York City, being a Summary and Interpretation of the Report on the Educational Aspects of the School Inquiry.* By P. H. Hanus. Yonkers, N. Y., 1913, pp. 121.
531. New York City, N. Y. *New York School Inquiry. Reply of the Superintendents.* By J. S. Taylor. New York, 1914, pp. 116.
532. New York City, N. Y. Help-your-own-school suggestions. Extracts from a Field Study of P. S. 188B Manhattan made at the request of Principal E. Mandel. Bureau of Municipal Research, *Municipal Research*, No. 31: Feb., 1914, pp. 32.
533. North Stonington, Conn. *Educational Enquiry.* State Board of Education, Hartford, Conn., 1916, pp. 29.
534. Oakland, Cal. Summary of a survey of the school department of Oakland. *Report No. 19, Tax Association of Alameda County*, Oakland, Cal., June, 1915, pp. 20.
535. Oakland, Cal. Report of a survey of the organization, scope, and finances of the public school system of Oakland, Cal. By E. P. Cubberley. *Board of Education Bulletin* No. 8, Oakland, Cal., June, 1915, pp. 48.
536. Ogden, Utah. *Report of the Ogden Public School Survey Commission.* By W. S. Deffenbaugh and others. State Department of Education, Salt Lake City, Utah, 1914, pp. 42.
537. Portland, Oregon. *Report of the Survey of the Public School System of School District No. 1. Multnomah County, Oregon, City of Portland.* Portland, The Committee, 1913, and Yonkers, N. Y., 1915, pp. 441.
538. Port Townsend, Wash. A survey of the Port Townsend public schools. H. G. Lull, director. *University of Washington Bulletin, University Extension Series* No. 17, *General Series* No. 95, Seattle, Wash., Aug., 1915, pp. 112.
539. Reading, Pa. Report on a survey of the board of education. By the New York Bureau of Municipal Research. *Report on a Survey of the Municipal Departments and the School Districts*, Chamber of Commerce, Reading, 1914, 339-367.
540. Richmond, Ind. Report of the Richmond, Indiana, survey for vocational education. R. J. Leonard, director. *Indiana State Board of Education, Educational Bulletin*, 18: Indianapolis, Ind., Dec. 1, 1916.
541. Richmond, Ind. Survey of the Kindergartens of Richmond, Indiana. By Alice Temple. *Supplementary Educational Monographs*, 5: Chicago, Ill., 1917, pp. 58.
542. Richmond, Va. Vocational education. Under the direction of L. P. Ayres. *Bureau of Labor Statistics Bulletin* No. 162, Washington, D. C. Aug., 1915.
543. Rockford, Ill. *A Review of the Rockford Public Schools.* Board of Education, Rockford, Ill., 1915-1916, pp. 126.
544. St. Paul, Minn. *Classroom Instruction in St. Paul, Minn. Help-your-school Surveys.* Bureau of Municipal Research, New York, 1913.
545. Salt Lake City, Utah. *Report of a Survey of the Public School System of Salt Lake City, Utah.* Board of Education, Salt Lake City, June, 1915, pp. 324.

546. San Antonio, Texas. *A Survey of the San Antonio Public School System.* By J. F. Bobbitt. San Antonio, May, 1915, pp. 257.
547. San Francisco, Cal. *Some Conditions in the Schools of San Francisco.* School Survey Class, San Francisco, May, 1914, pp. 96.
548. Seymour, Conn. *Educational Enquiry.* State Board of Education, Hartford, Conn., 1916, pp. 26.
549. South Bend, Ind. *Superintendent's Report of the School City of South Bend, Indiana, and School Survey by the Department of Education of the University of Chicago.* Board of School Trustees, South Bend, Ind., Sept., 1914, pp. 219.
550. Springfield, Ill. *The Public Schools of Springfield, Illinois.* Under the direction of L. P. Ayres. Russell Sage Foundation, New York, 1914, pp. 152.
551. Syracuse, N. Y. *Report of Investigations for the Associated Charities of Syracuse, N. Y.* Bureau of Municipal Research, New York, 1912, pp. 12.
552. Waterbury, Conn. Waterbury public schools. *Help-your-school Surveys,* Bureau of Municipal Research, New York, 1913.

DIVISION I

STATE, COUNTY AND OTHER SURVEYS

553. Alabama. Alabama's public school system. A comparative study. *Department of Education Bulletin*, No. 55, Montgomery, 1916, pp. 32.
554. Alabama (Covington, Macon and Morgan Counties). An educational survey of three counties in Alabama. *Department of Education Bulletin* No. 43, Montgomery, 1914, pp. 179.
555. Arizona (Maricopa County). *Report of the School Survey Made in Maricopa County by the County Teachers' Association and the Arizona State Taxpayers' Association.* Arizona State Taxpayers' Association, 1917, pp. 8.
556. California (San Mateo County). Reorganizing a county system of rural schools. By J. H. Williams. *U. S. Bureau of Education Bulletin* No. 16, 1916, pp. 50.
557. Colorado. The rural and village schools of Colorado. An eight-year survey of each school district, 1906-13, inclusive. By C. G. Sargent. *Colorado Agricultural College, Series 14*, No. 5, 1914, pp. 106.
558. Colorado. A general survey of public high-school education in Colorado. *University of Colorado Bulletin*, 14: Oct., 1914, pp. 92.
559. Colorado. Report of an inquiry into the administration and support of the Colorado school system. *U. S. Bureau of Education Bulletin* No. 5, 1917, pp. 93.
560. Connecticut. *Report of the Special Educational Commission.* State Board of Education, Hartford, 1909, pp. 14.
561. Delaware (New Castle County). Mental status of rural school children. By E. H. Mullan. *Reprint No. 377 from Public Health Reports*, Washington, D. C., 1916.
562. Georgia (Bulloch, Clayton and Taliaferro, Jackson, Monroe, Morgan, Raban and Randolph Counties). *Educational Surveys.* By M. L. Duggan. Department of Education, Atlanta, 1914-16.
563. Illinois. Reports of the Illinois educational commission to the General Assembly of the state of Illinois. *Biennial Reports of the Superintendent of Public Instruction*, 1908-10, 506-612 and 1910-12, 30-34.

564. Illinois. *A Statistical Survey of Illinois Colleges*. By B. W. Brown. Council of Church Boards of Education, Chicago, 1917, pp. 78.
565. Illinois. *Report on Educational Administration*. By J. M. Mathews. *Report of the Economy and Efficiency Committee*, 403-485. Springfield, 1915.
566. Illinois. *A Survey of the Field and Service of McKendree College, Lebanon, Ill.* By H. W. Hurt. 1917, pp. 31.
567. Illinois. *Illinois School Survey; a Cooperative Investigation of School Conditions and School Efficiency*. L. D. Coffman, Director. Illinois State Teachers' Association, 1917, pp. 377.
568. Indiana (Greene County). *Educational Survey*. By D. C. McIntyre. Bloomington, Indiana, 1916, pp. 110.
569. Indiana (Jefferson County). Report of the Jefferson County survey for vocational education. *Educational Bulletin* No. 20, *Indiana Survey Series*, No. 5, Jan., 1917, pp. 87.
570. Indiana (Porter County). Rural school sanitation, including physical and mental status of school children in Porter County, Ind. By T. Clark, G. L. Collins, and W. L. Treadway. *U. S. Public Health Bulletin*, No. 77, 1916, pp. 127. *Mental Status* reprinted.
571. Iowa. Report on the hygienic conditions in Iowa schools. By I. King. *University of Iowa Extension Bulletin* No. 11, May, 1915, pp. 36.
572. Iowa. State higher educational institutions of Iowa. *U. S. Bureau of Education Bulletin*, No. 19, 1916, pp. 223.
573. Kansas. Survey of accredited high-schools and professional directory. By H. W. Josselyn. *University of Kansas Bulletin*, 15: July, 1914, pp. 252.
574. Maryland. Report of the Maryland educational commission. *Department of Education Bulletin*, No. 2, Jan., 1910, pp. 10.
575. Maryland. *Report on the Educational Situation in Maryland by a Special Committee of the Board of State Aid and Charities*. Maryland School for Boys, Loch Raven, Md., 1914, pp. 33.
576. Maryland. *Preliminary Report of the Maryland Country Life Commission*. 1914, pp. 32.
577. Maryland. *Public Education in Maryland. A Report to the Maryland Educational Survey Commission*. By A. Flexner and F. P. Bachman. General Education Board, New York, 1916, pp. 176.
578. Maryland (Montgomery County). An educational survey of a suburban and rural county. By H. N. Morse, E. F. Eastman, and A. C. Monahan. *U. S. Bureau of Education Bulletin*, No. 32, 1913, pp. 68.
579. Massachusetts. Report of the commission on industrial and technical education. *Teachers College Educational Reprints* No. 1, New York, 1906, pp. 196.
580. Michigan (Upper Peninsula). Report of the bureau of research of the Upper Peninsula Education Association. *Mining Journal*, Marquette, Sept., 1913, pp. 48.
581. Minnesota. The rural school system of Minnesota. A study in School Efficiency. By H. W. Foght. *U. S. Bureau of Education Bulletin*, No. 20, 1915, pp. 56.
582. Missouri (Saline County). A study of the rural schools of Saline County, Mo. By J. D. Elliff and A. Jones. *University of Missouri Bulletin*, 16, No. 22, Education Series No. 11, Columbia, Mo., Aug., 1915, pp. 32.
583. New York (Oswego County). *A Survey of the First Supervisory District of Oswego County, State of New York, 1915-1916*. By Mildred Pratt. pp. 114.

584. New York (Westchester County). *A Study of Local School Conditions*. By A. J. Inglis. Westchester County Research Bureau, White Plains, N. Y., 1912, pp. 29.
585. North Dakota. *Report of the Temporary Educational Commission to the Governor and Legislature of North Dakota*. Grand Forks, N. D. The State, 1912, pp. 61.
586. North Dakota. State higher educational institutions of North Dakota. *U. S. Bureau of Education Bulletin*, No. 27, 1916, pp. 204.
587. Ohio. *Report of the Ohio State School Survey Commission to the Governor*. State School Survey Commission, Columbus O., 1914, pp. 352.
588. Oregon (Lane County). A rural survey. By F. C. Ayer and H. N. Morse. *University of Oregon Bulletin*, New Series, 13, No. 14, Aug., 1916. Education treated 71-109.
589. Oregon. Report of a survey of the University of Oregon made by the U. S. Bureau of Education, 1915. *University of Oregon Bulletin* 13, No. 4, Dec., 1915, pp. 28.
590. Pennsylvania. *Report on Rural Schools*. Pennsylvania State Educational Association, Harrisburg, Dec., 1914, pp. 103.
591. Pennsylvania. The Pennsylvania state normal schools and public school system. By E. O. Holland. *TchCollConEd*, 55: New York, 1912, pp. 94.
592. Porto Rico. *A Study of Certain Social, Educational, and Industrial Problems in Porto Rico*. By M. Bloomfield. Boston, 1912, pp. 28.
593. Texas. *The Organization and Administration of a State's Institutions of Higher Education*. By A. Lefevre. Austin, 1914, pp. 524.
594. Texas. A study of rural schools in Texas. By E. V. White and E. E. Davis. *University of Texas Bulletin* No. 364, Extension Series No. 62, Oct., 1914, pp. 167.
- 594a. Texas. *The State Institutions of Higher Education in Texas*. By the Educational Campaign Committee. Austin, Texas, 1912.
- 594b. Texas. *A Survey of Rural Schools in Travis County, Texas*. By E. E. Davis, Austin, Texas, 1916.
595. Vermont. *Secondary Education in Vermont*. By R. McFarland. Middlebury. 1912, pp. 42.
596. Vermont. Education in Vermont. *Carnegie Foundation for the Advancement of Teaching Bulletin* No. 7, Pts. 1 and 2, 1914, pp. 214.
- 596a. Vermont. *Report of the Commission to Investigate the Educational System and Conditions of Vermont*. Brattleboro, 1914.
597. Virginia. Report of the Virginia education commission to the General Assembly of the Commonwealth of Virginia. *Senate Document* No. 3, 1912, pp. 102.
598. Washington. A survey of educational institutions of the state of Washington. *U. S. Bureau of Education Bulletin*, No. 26, 1916, pp. 228.
599. Wisconsin. *Report of the Commission upon the Plans for the Extension of Industrial and Agricultural Training*. Madison, 1911, pp. 135.
600. Wisconsin. *Preliminary Report on Conditions and Needs of Rural Schools in Wisconsin*. State Board of Public Affairs, Madison, 1912, pp. 92.
601. Wisconsin. *Preliminary Report of the Committee of Fifteen Appointed to Investigate Educational Needs and Conditions in Wisconsin*. C. P. Cary, Madison, 1912, pp. 30.
602. Wisconsin. *Report upon the Survey of the University of Wisconsin*. State Board of Public Affairs, Madison, 1914, pp. 957.
- 602a. Wisconsin. *Conditions and Needs of Wisconsin Normal Schools*. State Board of Public Affairs, 1914.

603. Wisconsin. *Survey Summary re University of Wisconsin*. Wisconsin Efficiency Bureau, Madison, 1915, pp. 105.
604. Wisconsin. *The Milwaukee County School of Agriculture and Domestic Economy*. By Walter Matscheck. Madison, 1916, pp. 73.
605. Wyoming. Educational survey of Wyoming. By A. C. Monahan and Katherine M. Cook. *U. S. Bureau of Education Bulletin*, No. 29, 1916, pp. 120.
606. United States. *A Comparative Study of the Public School Systems in the Forty-Eight States*. Russell Sage Foundation, New York, 1912, pp. 32.

NATIONAL ASSOCIATION
OF
DIRECTORS OF EDUCATIONAL RESEARCH

CONSTITUTION

ARTICLE I

Name.—The name of this organization shall be the National Association of Directors of Educational Research.

ARTICLE II

Object.—The object of the Association shall be: (1) the formation of independent departments of educational research in all systems of public instruction, and (2) the promotion of the practical use of educational measurements in all educational research having for its object the improvement of the efficiency of the educational administration, supervision or teaching.

ARTICLE III

Membership.—SECTION 1. In general, membership in the Association shall be restricted to those who are actively and mainly engaged in research work having for its direct purpose the evaluation of the products of educational training or the improvement of the efficiency of educational teaching, supervision or administration.

SEC. 2. Membership in the Association may be either regular or associate. Regular members shall have any and all of the rights and privileges of the Association, including the right to vote, to hold office, and to appear upon any formal or informal program of the Association. Associate members are not eligible for office, have no vote and may not appear in any formal program of the Association, or otherwise represent the Association in public meetings, without special invitation of the Executive Committee; but they are to receive all bulletins of the Association, to be notified of all meetings or other activities and no distinction is to be made in any informal meeting or program between them and regular members.

SEC. 3. Any person holding the position of Director of, or supervising, a Department of Educational Research in an educational institution, or any immediate assistant of such director, shall be eligible for full membership.

SEC. 4. Any person actively engaged in research work in education, but holding some educational position other than in a department of research shall be eligible for associate membership.

SEC. 5. The Executive Committee, through the Secretary, shall, if necessary, ask all applicants for membership to state their positions, duties and past achievements in measurement work, and decision as to eligibility shall be made by the Executive Committee. In all cases where the applicant holds two or more positions, one of which has to do with educational research, the decision of the Executive Committee shall be made in accordance with the intent of the qualifications for membership as outlined above. Regular members who have not contributed to the bulletins of the Association during the year shall automatically become associate members at the annual meeting next following.

ARTICLE IV

Dues and Assessments.—There shall be no regular annual dues. The expenses incidental to carrying on the work of the Association shall be met by an assessment voted at each regular annual meeting.

ARTICLE V

Officers.—The officers shall consist of a president, a vice-president, and a secretary-treasurer. These officers shall be elected at the regular annual meeting of the Association. Their duties shall be those usually performed by such officers.

ARTICLE VI

Executive Committee.—There shall be one executive committee of five members consisting of the officers and the two preceding presidents whose duty shall be the conduct of the business of the Association between meetings.

ARTICLE VII

Meetings.—The time and place of holding the annual meeting shall be determined by a vote of the Association. Special meetings of the Association or of the executive committee may be called by the president, and must be called by him whenever requested by a majority of the executive committee.

ARTICLE VIII

Amendments.—Changes in this constitution may be made at any annual meeting of the Association by the affirmative vote of two-thirds of the members present.

THE EIGHTEENTH YEARBOOK

OF THE
NATIONAL SOCIETY FOR THE STUDY
OF EDUCATION

PART I THE PROFESSIONAL PREPARATION OF HIGH-SCHOOL TEACHERS

SECTION I
THE UNIVERSITY OF WISCONSIN PLAN FOR THE PREPARATION
OF HIGH-SCHOOL TEACHERS

By H. L. MILLER

SECTION II
MISCELLANEOUS PROBLEMS IN THE PREPARATION OF HIGH-
SCHOOL TEACHERS

By S. S. COLVIN, T. W. GOSLING, L. V. KOOS AND CLIFFORD WOODY

SECTION III
REPORT OF THE COMMITTEE OF THE SOCIETY OF COLLEGE
TEACHERS OF EDUCATION ON PRACTICE TEACHING
FOR SECONDARY TEACHERS

By G. N. CADE, S. S. COLVIN, CHAS. FORDYCE, H. H. FOSTER, W. S. GRAY,
A. R. MEAD AND F. C. WHITCOMB

Edited by GUY M. WHIPPLE AND H. L. MILLER

This Yearbook will be discussed at the Chicago meeting of the
National Society, February 24, 1919, 8:00 P. M.

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EDITORS' PREFACE

As early as 1904, the National Society, in its *Third Yearbook*, took up the discussion of problems connected with the preparation of teachers. This was continued the following year in Part I of the *Fourth Yearbook* ("The Education and Training of Secondary Teachers"), while closely related discussions have appeared in the *Fifth Yearbook*, Part II ("The Certification of Teachers") and in the *Fourteenth Yearbook*, Part II ("Methods for Measuring Teachers' Efficiency").

In 1914, Professor S. C. Parker, then Secretary of the Society, suggested to Professor H. L. Miller that he present to the Society an account of the methods developed by him at the University of Wisconsin for the preparation of secondary-school teachers. Later Professor Miller consented to act informally as "chairman" of a group of persons who should cooperate in the production of a *Yearbook* dealing with the "Organization and Administration of Practice Schools Generally." This undertaking expanded in various directions until it became necessary, from practical expediency, to limit the scope of the project for the time being to the training of high-school teachers only. We have been fortunate enough in this connection to arrange for the inclusion with Professor Miller's group of a report of a Committee of the Society of College Teachers of Education that was investigating the use of practice schools in training high-school teachers.

The present *Yearbook*, then, comprises three sections. In Section I appears Professor Miller's original manuscript describing the plan of preparing teachers at the University of Wisconsin. This plan is novel enough to challenge the attention of all readers, since it involves a theory of classroom procedure applicable to any high school, whether concerned with teacher training or not.

In Section II are assembled three contributions dealing with miscellaneous problems in the preparation of high-school teachers while in Section III is presented the Report of the Committee of

the Society of College Teachers of Education, already mentioned. In these two sections will be found, among other things, two statistical studies (one by Professors Koos and Woody, one by Professor Mead) that present important analyses of present conditions in the training of high-school teachers and point the way to methods for bettering certain deficiencies of preparation. There will also be found a discussion of the preparation of teachers for the junior high school which will be timely in view of the current movement for the reorganization of elementary and secondary education. The remaining chapters all contribute directly and helpfully to the general topic of teacher preparation.

G. M. WHIPPLE,
H. L. MILLER,
Editors.

SECTION I

THE UNIVERSITY OF WISCONSIN PLAN FOR THE PREPARATION OF HIGH-SCHOOL TEACHERS

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INTRODUCTION

Section I of the Eighteenth Yearbook is intended to present a plan of preparing teachers for practicing their profession in a democracy. The conception is that a real and genuine democracy originates in self-activity and is carried forward in self-activity. The view developed and illustrated herein is rooted in participation. There is in it a clear way for each individual within a working group (a class group) to cultivate his own initiative and to develop his own originality.

Social psychology is considered an aid to a sane orientation to the philosophy underlying the procedure presented in this account. The doctrine that every child is a candidate for personality is the prototype to the view that the college senior is likewise a candidate on the way, assuredly developing a teaching personality. Since the evolving person creates himself by his own activity, and since no person creates himself in a vacuum, it is obvious that the clutch which throws the intellectual and moral forces into action is cooperative doing and participating in a social group in which the life of each member is refertilized and rejuvenated by the sharing of the interests of all in a controlled environment.

Now the machinery of control, like the scaffolding in the building, should be used for a purpose outside of itself. Morality may be likened to an iceberg: seven eighths of it is out of sight. So it is in education. Organization must not occupy the center of the field of

attention. System is necessary ; but it must be subordinated to the life which it is designed to serve. The problem of all problems in administration, in supervision, in teaching, is to get a dynamic in each of these agencies and to be sure of it that a productive dynamic is maintained in every-day practice. American education must guard and foster our ideals—ideals soundly rooted in democracy. We must not become enslaved by the majesty of plan and precision.

If, therefore, our education is to be and to become increasingly the life blood of our new and ongoing democracy, ways and means must be found to keep our superstructure of organization from becoming an ugly mechanical efficiency. The upspringing and emerging quality of conspicuous merit from all and unexpected quarters must remain a guiding principle in the processes of democracy. It is democracy *in* education that is needed today. The system of organization must be installed underground if it is to serve adequately the life of our nation. Power to choose comes by choosing and in no other way. Knowledge is capacity and not possession. A way of thinking is absolutely essential to any productive handling of brute facts and information. Our education needs constantly to be *deformalized*. Participating in a socializing procedure is a splendid guarantee to our ongoing democracy. Every individual counts. Not only this: every item of experience has value. One's own mental and spiritual life is quite as much the result of one's neighbor's social activity in a mutually shared life as it is of one's own brain. Self-activity presupposes cooperative sharing of interests.

It is only by participating and by reacting in terms of some ongoing procedure that self-activity is possible. Section I is offered as a slight contribution in the hope that a genuinely democratic education may be a developing program with us, yielding, as it should, to the solvent of new social reagents in the making of the responsible person, capable of realizing the fullest self-expression consistent with public welfare. This, it is believed, constitutes the basis of our democracy. The public school is to be, in a far clearer sense than ever before, the practicing ground of our democracy.

The new teacher, fully adequate to the new job of reconstruction and building in the new day of America's democracy, needs

most of all to be a democrat. The institutional schoolmaster, with his emphasis upon ready-made subject matter and status in either instruction or conduct, can not measure up to this new and inspiring task. The key note in the future must be independence of human personality. The new teacher is to be elected in a very real sense by the pupils on the basis of a reacting procedure in participating with them. The conception of the teacher as director replaces the drillmaster. The right to lead implies the duty to demonstrate ability to lead. Status is replaced by merit recognized by those who are most intimately concerned about it—the pupils. The mechanical separation between teacher-mind and pupil-mind does not find explicit expression in the view presented in the plan of *directed teaching* as set forth in this yearbook.

Chapter One is a presentation of principles and an explanation of procedure. Chapter Two is a collection of selected comments, briefly edited and presented for the purpose of illustrating the practical working of the plan used in the University of Wisconsin in the preparation of teachers.

CHAPTER I

DIRECTED TEACHING: A PLAN OF PREPARATION THROUGH PARTICIPATION

(ARRANGEMENT OF TOPICS IN CHAPTER I)

1. Introductory Statement
2. The Wisconsin High School
3. General Account of Procedure in the School
4. Participation of College Seniors
5. The Administration of the Course in Directed Teaching
6. Principles Underlying Directed Teaching
7. Discussion of the Departure Growing Out of These Principles
8. The Laboratory Idea
9. Education and Training
10. Subject Matter and Method
11. The Professional Contribution of College Teaching
12. The Need of Contact With Pupils as a Part of Professional Preparation
13. Justification for Undergraduate Professional Preparation
14. Expert Instruction in Education Courses Essential
15. The Teacher in the Demonstration School
16. The Status of the College Senior in This View
17. The Pupils of the School
18. Classroom Procedure
19. The Recitation System
20. Directed Study (Supervised Study) vs. the Recitation System
21. A New Teaching Responsibility in the Directing of Study
22. The Orientation of the New Teacher in Directed Study
23. Teaching in Terms of Individual Differences
24. The Problem of Out of Class Study—Home Study
25. A New Pupil Attitude Toward School Work, College Senior Included
26. Preparing the Way for Appearance of College Senior in Teaching Rôle
27. Recognition of Principles of Social Psychology
28. The Pupil, the Educative Unit
29. Summarizing Statement of Recitation System and Directed Study
30. The Indeterminate Assignment Idea
31. Minimal Essential Content: Objections to the Movement
32. Gripping Subject Matter and Procedure Under Organizing Principles
33. Uniform Assignment and Indeterminate Assignment Contrasted
34. Evaluation of Results in Terms of Traits Germane to Education

35. Points to be Clarified for the College Senior in Directing Attention to His Full Participation in the Course
36. The College Senior and Directed Study
37. A Type of Comparison Between Practice Teaching and Directed Teaching
38. Vitalizing Scholarship in Terms of Direction of Activity
39. The Nature of the Responsibility of the College Senior in the Wisconsin High School
40. A Wholesome Co-operative Undertaking for the College Senior
41. Daily Preparation, its Scope and Urgency
42. College Senior and Pupil Recitations
43. Opportunities for the Cultivation of Originative Capacity
44. Performance of College Senior Appraised by Pupils and Staff Teacher, Directly
45. Promotion of College Senior on Basis of Proved Merit to Assistant to Staff Teacher
46. Attitude of College Seniors—Responsible Members of the Class
47. The Student's Daily Written Report
48. The Function of Directed Teaching in the Experience of the New Teacher
49. Every Item of Experience Has Value

1. *Introductory and Explanatory Statement.* This report deals mainly with the procedure which is used in the University of Wisconsin. *Directed teaching*, as indicated in the title, is descriptive of a plan of practical professional preparation of college seniors qualifying for the University Teachers' Certificate. This term, *directed teaching*, is employed for the purpose of distinguishing procedure in the University of Wisconsin, more or less sharply, from the customary forms of *practice teaching*. One may well hesitate to introduce new terminology into educational literature. Already we have a plethora of courses in education departments with rather hazy lines of demarcation. Yet the writer feels that a real need of drawing distinctions arises in this discussion. It is not intended, however, that this new terminology shall carry more than a local significance. No disrespect is to be attached to the conventional phrase *practice teaching*, nor is it the purpose of this presentation to redeem it for the satisfaction of any of the academic group, who perchance, may be supposed to have no faith in accredited methods of training schools for teachers. The plan of inducting the college senior into the high-school class is unique in

Wisconsin, and for reasons that will appear, it is felt that the term "*directed teaching*" may be acceptable as a basis of economical discussion in this report.

2. *The Wisconsin High School.* This course has been made possible in the University of Wisconsin by the recent development of the Wisconsin High School—a six-year secondary school maintained by the University. The function of this school is set forth in the enabling act of the legislature: it is "To maintain a school for demonstration and practice in order to complete the facilities for the school of education." A modern building, adequately equipped, and provided with a liberal budget for maintenance and instruction, has been made possible by the support of the Regents and the administrative officers of the University—particularly the Director of the Course for the Training of Teachers.¹ From 275 to 300 pupils are enrolled each year, distributed within the classes of a Junior-Senior high school of cosmopolitan type. A nominal tuition fee of \$24.00 a year is collected. One-fifth of the enrollment is granted free scholarships.

The aims of the Wisconsin High School of the University of Wisconsin are three-fold. First, it undertakes to provide sane and thorough education for its pupils. A staff of trained, experienced, and competent teachers, fully adequate to the requirements of the school itself, is employed by the University. The purpose is to demonstrate the best practices of modern secondary education.

¹Professor Edward C. Elliott, Director of the Course for the Training of Teachers, University of Wisconsin, 1909-16, formulated the plan for the establishment of the Wisconsin High School, secured the building, initiated the program which has made possible rapid development since 1912, and as Director administered the affairs of the school in the first four years of its history. In Wisconsin the Course for the Training of Teachers is an administrative device employed to correlate a large number of departmental interests within the various colleges concerned with the professional preparation of teachers. The department of Education is organized within the college of Letters and Science. No professional school for teachers, as such, exists in the University of Wisconsin. Each department concerned in any direct way with the preparation of high-school teachers has on its staff a person who gives a departmental teachers' course. These courses, together with the work of the department of education and the activities of the Wisconsin High School of the University, are organized and administered under the Course for the Training of Teachers. This plan of organization brings together a variety of interests and emphasizes throughout the University the problem of teacher training.

Second, through the researches and careful experiments of its staff in new methods of teaching and new arrangements of subject matter, it aims to contribute to the high schools of Wisconsin productive suggestions regarding improvements in teaching procedure and in curricula. Third, by putting college seniors of the University into close contact with pupils in a high-school classroom and by carefully directing their activities, it endeavors to develop for the secondary schools of Wisconsin an unusually strong and competent corps of young teachers.

3. *General Account of Procedure in the School.* The entire six years' program of studies is arranged according to a consistent progressive plan, the endeavor of which is not merely to present subject matter of increasing degrees of difficulty, but also to develop in pupils an ever-growing personal efficiency in using stored-up subject matter to approach new and unexpected situations and to solve new problems. Pupils are dealt with as individuals; no pupil is held back because others are developing more slowly than he, and no one is pushed forward beyond his capacity merely because others are more rapid in developing power. The entire school procedure is flexible, not rigid; it encourages individuality, self-mastery, initiative, and personal responsibility. Set lessons definitely prescribing the upper limit of accomplishment of the good pupil, are rarely given. Mere question-and-answer recitations are avoided as much as possible. The teacher is a director of activities; his assignments, often arrived at in consultation with the class, determine the direction in which the group shall work, but do not prescribe the amount of accomplishment in that general direction which each pupil must, or may, make. Pupils who excel in accomplishment are rewarded by increased opportunities and responsibilities; frequently they are promoted for a day to assist the staff teacher in directing the class. Home study is usually not sharply distinguished from classroom activities; in general, the class hour is spent in working ahead, not in reviewing, summarizing, or reciting upon subject matter which has been studied out of school. Home work is ordinarily of the nature of unfinished business; that is, it completes, supplements, expands and verifies what has been begun

under the teacher's guidance within the class group. This practice of *directing study* tends to develop in each pupil the most effective habits of attention, concentration, and achievement which he is capable of acquiring; it develops his initiative, because he must begin his undertaking without depending upon the initiative of another for his ideas or the impulse to start; the teacher, an expert in education, is in general much better qualified than a parent to judge exactly what assistance may most profitably be given to a pupil in the study of lessons. The school aims to direct its pupils through subject matter to power. The curriculum and the expert activities of its teachers are but means to an end; they are tools for the fashioning of self-active, responsible young people. The endeavor is to determine by practical application the best possible choice and arrangement of subject matter and the most serviceable ways of teaching and school administration to further the development of pupils. Nothing is kept merely because it is traditional; nothing is discarded merely because it is unfashionable; an earnest attempt is made to be reasonably conservative and to keep free from educational fads. There is no disposition to conduct experimentation without regard to the immediate welfare of the pupils involved.

4. *Participation of College Seniors.* In its function as a teacher-training school the Wisconsin High School instructs, also, college seniors. These are received *as students* in the various classes of the school on a level with the pupils. Each one is regularly enrolled in a class for a period of nine weeks—five days a week; he receives no especial privileges and is in no way exalted above the class, or set up by authority to be a “practice teacher.” He has exactly the same opportunity which every pupil has; if he shows by his participation in the day's work that he has greater power than the other members of the class group, it is probable that he will be promoted by general assent to be for a part of the hour a leader, or teacher, of the class. By consistent, unflinching excellence he may win the right to assist the staff teacher through many successive days. Every pupil, however, has exactly the same opportunity. The chairmanship of the class, or active assistantship to the staff teacher, does not usually, in actual experience, regularly

come only to college seniors enrolled. Occasionally, although of course rarely, certain college seniors show by their participation in the class work that they are inadequate in power to be leaders of the group; after a time these seniors are dismissed from their candidacy for the University Teachers' Certificate. It should be remembered that throughout the class hour the staff teacher is always directly in charge. He may say little, or nothing at times, but the college senior or pupil conducts the activities of the group, or sections within the group, always under his eye. Criticism or correction is never deferred to a formal conference hour with the college senior; but, just as in the case of a pupil as leader, unproductive procedure is redirected at once. The highest interests of the class are conserved at all times. The significant point is that the college senior is a member of a class group, admitted on a clearly recognized basis of participation. His ability is not accepted because he is a college senior; he must prove his superiority in real competition with pupils in the work in which they are all engaged.

5. *The Administration of the Course in Directed Teaching.* It will doubtless be of interest to those engaged in the administrative duties of college work to examine the details of practice with respect to the assignment of students, sequence of courses, fulfillment of requirements, etc. The University of Wisconsin issues a bulletin dealing with such matters in Wisconsin.¹ Suffice it to state here that the college senior who desires to fulfill the requirements for the University Teachers' Certificate is required, along with other specified work, to earn two credit hours in the course—*Directed Teaching*. For the University Teachers' Certificate 128 hours are required; the degree of Bachelor of Arts is included, the requirement for which alone is 120 credit hours. This plan draws at once a distinction between two important ends. The University of Wisconsin is committed to the proposition that a college course of four years is no evidence in itself of ability to teach anything; in other words the professional preparation of teachers is recognized by the University. Two credit hours of the additional eight hours required for the University Teachers' Certificate may be used, if need be, to detect unfitness for teaching. Failure, however, to earn

¹See—*Course for the Training of Teachers*,—Bulletin No. 758.

credit in Directed Teaching does not disqualify the student for his college degree, but it does make it impossible for him to receive the full endorsement of the University for teaching as represented in the University Teachers' Certificate. This selective function of the course is, however, merely incidental, though highly important, to its main purpose and value.

At the beginning of each semester, college seniors qualifying for the University Teachers' Certificate enroll for the course—Directed Teaching—a two-hour course. The initial meetings of the group are conducted by the principal of the Wisconsin High School. The nature of the work is discussed, procedure explained, and general directions are given. During the second week each college senior is assigned to a high-school class-group for a period of nine weeks—five days a week. The semester is divided into two terms. Part of those enrolled are assigned to the second half of the semester. The college senior is usually assigned to a class in which his major subject is being taught. As a rule not more than two college seniors are assigned at one time to a given high-school class, although three may find it possible to participate together in a class group. No attempt is made to have the college senior participate in more than one class. Provision is made for students of unusual merit to continue in the course for an extra term, thereby earning a total of four credit hours in Directed Teaching. The college senior who makes slow, yet promising progress, is permitted to continue in the course longer than the nine-week period in the attempt to earn the minimum two hours credit. With the present facilities of the Wisconsin High School some two hundred college seniors may be adequately provided for each semester. Up to the present time about one hundred are reporting each semester; that means that the school is giving approximately two hundred college seniors each year some initial, practical experience with high-school pupils.

6. *Principles Underlying Directed Teaching.* College seniors are familiarized in the introductory discussions of this course with a few guiding principles which are designed to give direction and to assist both students and staff teachers in carrying forward in the most profitable manner the work of the course. In view of the fact that each college senior is thought of, first of all, as an in-

dividual, as will appear in subsequent discussion, rather than a more or less static unit in a rigid system, it is obvious that some unifying aims should be established. New members of the teaching staff also find the following tentative draft of principles helpful in gaining a ready and working understanding of procedure.

1. The prospective teacher needs, first of all, to gain a working conception of the correlative nature of scholarship and method. A true synthesis is to be found in a masterly control of subject matter in the process of education. Three elements, at least, are involved in adequate teaching; they are, gripping boys and girls understandingly, using subject matter with a functional outlook, and gripping ways and means of directing activity in a productive manner. The *whats* (subject matter) to teach must include the complicated and variable *hows* (method) of teaching. Any mechanical separation between academic scholarship and a professional training course must be bridged. The notion that one first acquires subject matter—amasses information, and then acquires his methods of teaching it, is held to be invalid and an unfortunate separation. Accredited scholarship is essential; no one questions the need of it. The problem arises in taking college seniors whose attention has been directed to academic views of scholarship and also, as a rule, to pedagogical considerations of method as something apart from subject matter, and with these ideas of a mechanical separation the task is to work out for them a valid and valuable relation between scholarship and method. Accredited methods developed as something outside of material and offered as ready-made formulae to be used on subject matter and pupils are not accepted. The emphasis, therefore, is placed upon the product or resultant of usable scholarship and some method of presenting subject matter. These elements, combined with intellectual and moral traits—teaching personality, in short—are focused upon a particular subject and situation in terms of teaching conditions of high-school grade. In reality the hiatus between scholarship, in the professional sense, and method disappears in the deeper currents of control of subject matter and in the direction of activity in the educative process.

2. In the process of orienting the college senior to the procedure of *directed teaching* the fact is made clear that the regularly constituted teaching staff of the school in which facilities for demonstration and participation are provided is charged with the immediate responsibility for the instruction

and direction of its pupils. A school, adequately equipped, and staffed with trained teachers is the first requisite. Parents and pupils must be assured of superior educational advantages if the school itself is to succeed. *Practice teaching*, as normally conducted, does not seem to be feasible under the circumstances existing in the Wisconsin High School. The procedure developed under *directed teaching* is not, however, the result of expediency. On the contrary, the proposition is maintained that *directed teaching* offers the prospective teacher a genuine professional opportunity and a scientific basis of introduction into teaching.

In addition to a regularly constituted teaching staff, fully adequate to the demands of instruction in the demonstration school for the pupils themselves, it is pertinent to note the fact that the policy is to have the instructor who gives the departmental teacher's course within the department of the college also teach in the Wisconsin High School. A *critic* teacher or supervisor of teaching is not employed. The fundamental conception is that the college teacher who undertakes to tell college seniors *how* and *what* to teach, shall himself be charged with the definite responsibility of demonstrating *how* and *what* to teach. Hence the plan of the Course for the Training of Teachers in Wisconsin contemplates a functional connection between special-method courses and concrete teaching by combining two correlative types of activity. The staff of the Wisconsin High School is composed of these representatives of various departments who teach two to three classes of pupils each day, and an additional number of teachers who give full time to teaching in the Wisconsin High School. Each staff teacher, whether the representative of a college department, or a full-time teacher, is given a distinct professional opportunity in the school in dealing with college seniors. Each staff teacher in fact is his own critic and supervisor. Each staff teacher is aware of his full responsibility towards the pupils of the school, quite apart from the professional aspects of his work.

3. The prospective teacher, seeking University approval to teach, is adopted into a working high-school class-group on the basis of an intimate, responsible relationship, and is required, for a time, to participate in the normal, legitimate activities of a directed and ongoing teaching procedure. The college senior takes a vital part in a procedure designed to illustrate by its own processes and to demonstrate through

its results some productive ways of dealing with the teaching problems of secondary education.

4. It is sought in this course to develop the student's powers of analysis, to direct self-criticism in particular and objective references, and to control conditions which are designed to foster self-directive capacity and to discover to students such originaive ability as each may be able to disclose. Self-expression is sought rather than uniform provision.¹

5. The test is thoroughly pragmatic, applied vigorously for a brief period (nine weeks) under a master teacher. It will be noted that the college senior is admitted on the pupil level as a member of the class. Some of the immediate situations which confront him are: Does he know the brute facts of subject matter, the *a, b, c* elements of the daily work? Can he command and array such facts in practical situations of a classroom sort, manipulate crucial points in a problem-solving situation, present a topic in a lucid, convincing manner take the "next step" in the movement of subject matter, grip the significant elements of a situation, etc.? The answer lies here; test him in the environment of actual teaching and thereby discover ability to go forward. The work begins where the pupils are. The first and practical responsibility of the college senior is to become the best pupil in the class—

¹In considering such qualities as self-direction, initiative, and originality attention is directed to a positive and dynamic meaning of these traits, such as Thorndike so effectively describes in *Teachers' College Record*, 17: p. 405 ff., 1916. "The view is to think of independence, not as unreadiness to follow or obey or believe in other men, but as a readiness and ability to contribute to good causes something more than is suggested by others; to think of initiative, not as an unreadiness to wait or cooperate or be modest, but as a readiness and ability to move ahead, 'speed up,' lead and take promising risks and as an attitude of expecting to create opportunities, and do ten dollars' worth of work for a dollar. Originality must not mean weakness in doing routine work in old ways, or any essential dislike of traditional knowledge or customs as such, or any paucity of fixed habits—but strength in doing work that is new or doing it in new ways, an attitude of hoping to change knowledge or practice for the better, an organization of habits that causes their progressive modification. . . . The dynamic opposite of originality is not efficiency, but stupidity. The dynamic opposite of efficient routine is not genius, but disorder. . . . Finally, will it not clear the whole argument somewhat if, in our own thinking about education, we replace the word 'self-reliance' by *reliance on facts*; 'self-direction' by *rational direction*; 'initiative' by *readiness and ability to begin to think and experiment*; 'independence' by *readiness to carry thought or experiment on to its just conclusions despite traditions and custom and lack of company*."

not always an easy task for the majority of college seniors. After demonstrated fitness to lead the class many and varied opportunities are given to assist the staff teacher. As noted above, this is not a privilege reserved exclusively for the college senior in the Wisconsin High School; pupils enjoy the same privilege as a part of their educational development under the doctrine of self-expression and the development of personal initiative.

6. The amount of apprentice experience is regarded as a subordinate consideration. The ability to put intelligent questions to experience is believed to be essential to good teaching. A taste for analysis in a few specific instances is deemed important in the growth of the teacher. Usable scholarship is emphasized. No attempt is made to have the college senior lay in a store of ready-made devices and negotiable patterns to teach by, twelve months hence. This caution does not preclude intelligent application of methods and procedures employed by successful teachers. A mechanical, if not blind, acceptance of attractive ways of handling a class is discouraged. It is the uncritical formalist who contributes to the deadening process of school keeping. In this course a very common question directed to the college senior is: "How would you proceed in this situation?" The aim is to conserve and develop originality and inventiveness. If the college senior employs some method of approach, more or less familiar in educational literature, or as the case might well be, adapts to the situation some plan of procedure utilized by a successful teacher, the deliberate purpose of this course is to encourage a critical examination of results in terms of pupil-response. In other words, the intending teacher is not permitted to go on thinking that any device, however plausible, is a finished product, having an absolute value in itself. He is asked to think of each datum of experience as having a unique quality and to look upon teaching as a progressing series of circumstances which must be met with fresh and original energy. Yet nothing is discarded simply because it is traditional, nor is it urged that new and amazing devices shall be invented by college seniors. They are taught to examine their experience with such critical ability as they may develop. This rigid and continuous discipline under the direction of a master teacher is designed to render the progress of the future high-school teacher toward successful professional accomplishment more rapid, more economical and more confident than it would otherwise be.

7. Student's Daily Report.¹

STUDENT'S DAILY REPORT

(Surname first)

(Staff teacher)

(Date)

Emphasis is on growth in self-direction and capacity for self-criticism. Avoid ready-made methods and ready-made knowledge. Think of *teaching* as directing activity by creating situations to which pupils (and college seniors) and teacher react—at the fork of the road—with thought compelling, vitalizing questions (before answers) in a problem-solving procedure. You are an active, participating member of a working group, responsible every day for *all* situations in the class period. Avoid falling into formalism. Rise above the obvious in reporting. Mere observing is not productive. It is the quality of your participation that counts. You are making your own record. This report is a partial account of your work and your thinking, both in and out of class. Focus here what you deem significant in your own developing experience.

[Space for student's report]

¹On this card the college senior writes a diary of his experience in the high-school class. Ordinarily, two to three pages are written each day, giving a personal account and judgment of the day's work. The printed paragraph serves the purpose of reminding the college senior, from time to time, of the general nature of his responsibility. A complete file of these reports is kept in a certain room in the building to which college seniors report each day. The staff teacher and principal confer with the student and make it a point to write constructive comment and suggestion upon these daily reports. It is from these diaries that the "selected comments" are chosen that are quoted later in this report.

7. *Discussion of the Departure Growing Out of These Principles.* Obviously, it is what the college senior actually does in the high-school class during this period of some forty days that gives point to the plan presented in this report and, in a measure at least, justifies the undertaking. The rather simple procedure of introducing the college senior on a level with the pupils is perhaps the most difficult part of the plan for an 'outsider' to accept, yet upon reflection there is usually agreement in the view that the essential condition is to get the prospective teacher on high-school ground. At all events, the college seniors at Wisconsin find this initial experience a stimulating and interesting occasion. There is something tangible for them to do at once, and there is no delay in getting started. The requirements are immediately possible of accomplishment and college senior, pupils, and staff teacher—all, know whether or not practical situations have been adequately met. There is no guess work about it; no beautiful theories are accepted when brute facts are demanded. The college senior is admitted without prejudice. Pupils are uniformly courteous, and, as a rule, waste no time in inducting the college senior into the work of the class. There is nothing artificial or formal in the procedure; a perfectly natural relationship is established. The staff teacher controls the general situation; all meet together on the common ground of work. The college senior is accepted immediately and is never permitted to continue as an "observer." The partnership idea is established at once upon the basis of wholesome and definite participation. The college senior is not placed before a group of pupils in the embarrassing capacity of the "new" teacher. Practice in disciplining or managing a group of "practiced-on" pupils is not considered a profitable procedure. The novice does not appear in the rôle of a teacher with an assortment of ready-made devices and a portion of ready-made subject matter and a plan book with a predetermined procedure. One is reminded of the situation in a certain practice school in which the tenth "new" teacher appeared within a period of six weeks. Some conventional question was put to the class. No one rose to it. It was put again with slight change. No response was evoked. Again a slight change was made, and again no response. Finally a little boy piped up,

saying: "Miss, we all know what you want, but you ain't asked the question yet that will fetch it."

Working for a time with pupils, as one of them, accepting in reality the challenge to compete with them in matters of fact, information, and judgment is a procedure by which an intimate knowledge of pupils is gained. Once established in the confidence of pupils on a basis of cooperative doing and thinking, the student is in a fair way to begin to sense the educational movement of the class as a whole. He should be cured of the pernicious habit of 'talking down' to the supposed level of high-school pupils, with little respect for their developing powers and mental integrity. It is not probable that the novice can by looking on, or by observing teaching, succeed in detecting the interaction of mind—the way teacher and pupils react upon each other. The student at this stage needs, most of all, to develop acumen which will enable him to see what is going on, and to evaluate what he sees. This is most likely to happen under the scrutiny of a group of persons working under classroom conditions.

It is easy to bring to the situation ready-made devices and suppositions. The unscientific critic is quick to pronounce the phenomena he touches as "true" or "false," "good" or "bad," "right" or "wrong." The experience of college seniors in *directed teaching* seems to run along lines of cautious judging of new propositions—a disposition which inclines toward a scientific temper of mind. To be held definitely responsible for the next step, and the next, in a progressing series of situations whose elements are of uncertain formation encourages the habit of forming tentative judgments. Adequate teaching must be inventive all the way.

8. *The Laboratory Idea.* Adequate teaching in secondary schools is demanding more and more a realistic and genuine application of the laboratory idea. "First, the person who would be scientific must determine what he is setting out to do. Next, he must collect the materials which are available for his purpose. Then he must allow his *materials to re-define his purpose*, for when he gets them together, he usually finds that they will not permit him to do just what he originally planned: that is, they *set a new problem* very much more concrete and definite than that with which he

started, and frequently they give it quite an unexpected turn. He must now proceed to work out this new problem and shape or formulate his results."¹

This statement represents the movement of intellectual processes under the method of science. It is fair to assume that the teaching of all subjects will be greatly improved by the application of some such clearly defined order of procedure. No one is likely to object to the scientific method. Even the person of artistic temper finds no serious difficulty in subscribing to the general scheme of procedure as stated above. Clearly, the person who would effect any form of professional work must determine what he is setting out to do, examine available data bearing on the problem, allow his materials to re-define his purpose, etc. A trade requires the work of an artisan. In it a mechanical repetition of a few comparatively simple motions is necessary. To follow a blue print, to work to a line already established, may require a high degree of skill, but little individual initiative. The work of teaching, if it is to be conceived as a profession and not a trade, exacts of those who would enter it a kind of service which is characterized at all times by ability to act upon individual initiative—a quality which develops by exercise. Self-judging of one's own performance is essential to any kind of artistic outcome. One must test, as it were, the value and effect of each stroke as the work progresses.

The laboratory idea is set forth in sharp contrast to the apprentice idea. The latter is concerned with the automatics of the trade. In routine industrial processes the laborer needs to know what motions are necessary in a given situation. He needs to repeat these motions until they can be carried forward automatically with a high degree of speed and efficiency. The aim is to turn out a uniform product. In highly mechanized industry there is the danger of a lethargizing, soul-deadening effect on account of repetition of a few motions. The simplification of the work of the laborer in the factory has gone forward at the expense of his intellectual life. The machine is master of the man. Routine work on the basis of habit is not, in itself, a means or stimulus to mental growth.

9. *Education and Training.* Education is more than train-

¹Moore. *What is Education*, p. 202.

ing. Education stresses growth. Training rests upon habit. It is a far cry from the routine of the artisan to the rule-of-thumb devices of the teacher. Nevertheless, the similarities are easily detected. The demand that education should be conducted as business, when analyzed, ordinarily results in marked emphasis upon training. The attempt to apply to teaching the principles of business management frequently proves futile on account of badly drawn analogies from trades. Pedagogy has fallen into disrepute because it has too often been identified with ready-made devices which are supposed to equip the would-be teacher for his vocation. The apprentice idea has, unfortunately, operated to the disadvantage of the professional preparation of teachers. The phrase, *training school*, carries with it an implication of questionable value, for the reason that training is not associated vitally with the educative process interpreted in terms of growth and of the development of personality. There is no objection to a study of methods, as such, with a view to trying them out after a rigid practice in self-judging and self-direction has been provided. If it is recognized that the essential quality in education is adaptability; that pupils must be regarded as self-active persons; that self-expression under guidance lies at the center of a rational philosophy of education; and that in order to realize these ends teaching must be given a functional definition in terms of the learning processes of pupils, then it would appear that emphasis may very properly be placed upon a study of accredited methods. The ability to get back of any device and to modify it to meet new situations is required of the adequate teacher. The laboratory experience, as the student's participation in directed teaching is conceived to be, is intended to prepare the candidate for a discriminating use of those particular methods, whether accredited or self-initiated, which he desires to try out.

10. *Subject Matter and Method.* The traditional disparagement of the professional preparation of teachers by many college professors is no doubt due in large measure to the divorce between scholarship and method. The separation has given rise to such hackneyed expressions as: "When an individual knows a subject, he can teach it" and its counter: "One can learn a *method* by which to teach anything." The familiar saying that "teachers,

like poets, are born, and not made," represents another form of this academic skepticism. "Teachers are such by the grace of God." The pernicious character of this doctrine is obvious. An insidious fatalism supports the view. Yet it may be dismissed as a gratuitous misapprehension of the profession of teaching. The alternative is not necessarily inclusive, viz., the assumption that a teacher can be made out of any sort of person. The problem is blurred if it is alleged that certain native gifts must exist before it is possible to think of the potential teacher. A frank recognition of the possibility of professional preparation implies the thesis that changes of some sort are to be effected in the persons preparing to enter the vocation of teaching. It goes without saying that those who are committed to the program of professional preparation of teachers accept the view that an effective teaching personality is a matter of development and direction.

On the one hand, it is urged that scholarship is the essential achievement of the prospective teacher, and that it is the only genuine and fundamental preparation that can be provided. The additional qualification is 'personality,' for the presence of which the proponents of the academic view disclaim all responsibility. "If one possesses scholarship and personality, one can teach" sums it up in a few words. The opposite contention, it is alleged, is that *method* is so important that one can acquire it in some one or more of its forms and then use it on any kind of subject material and pupils of certain ages. These assumptions are both entirely unsatisfactory. The rigid separation between scholarship and method is unnecessary and in reality misleading.

It is impossible to think of subject matter apart from some way of handling it. This is particularly true in connection with its uses in education. All teaching presupposes interaction of mind—a bond of connection between teacher and students. The interplay of forces is directed by means of some sort of subject matter. It is a part of the process to consider how the subject is developed and how mind answers to mind. Good teaching, no matter at what stage in the educational process, reveals evident design in the use of subject matter. 'Method,' in its deeper and better sense, is an integral part of the process. It is not a thing apart, capable of

detachment and separate manipulation and *then* of application to subject matter. It inheres in the subject matter itself. Only when subject matter is approached as a body of static material, organized and labeled, is it possible to conceive that method can be imposed upon it. When so conceived, method has been construed to be a ready-made device that can be clapped on a section of ready-made knowledge when it is deemed wise and proper to bring the student and subject matter together, as if subject matter were somehow stored up in packages to be delivered, intact, to students at suitable times. Much of this doctrine is being discarded in the light of a functional definition of education. The student must build his knowledge. He must exercise his mind. Subject matter has meaning for him only in terms of using it, by building or constructing it. It is in the process of the learner's own building of his knowledge that subject matter becomes significant for him. The method inheres in the direction of the development of subject matter. Control of subject matter for practical, academic, or professional ends requires direction of activity. No one would be so naïve as to suppose that a course of study could be conducted without giving attention to objectives and ways of attaining them. In the educational process adequate teaching, whether elementary, secondary, or collegiate carries the implication of method. Instead of conceiving subject matter as being independent of method, it would appear that it is best to emphasize their functional dependence.

11. *The Professional Contribution of College Teaching.* It follows that scholarship is an invaluable tool, in itself, in the development of professional fitness for teaching. If all collegiate teaching were of the first order, the college graduate would be far better equipped to begin high-school teaching than is commonly the case. Some college teaching is good; some of it is of the highest order. The student is able to detect a masterly development of a course, and not infrequently makes explicit the method of handling the subject matter. Its organization, presentation, and progression may become a matter of keen interest. To such a student good teaching contributes, over and above academic value, a distinct professional quality. It is conceivable that the college graduate who has ex-

exercised keen perception and discrimination in studying collegiate teaching in this independent manner can make useful application of such results in high-school teaching. Scholarship is narrowly interpreted if limited to a mere acquisition of what is offered in college courses. The productive, as well as the assimilative, side of development should be included. From the student's point of view it is entirely possible to become a close student of the direction of the development of a course, and to contribute, as a silent partner perhaps, to the working out of procedure. No better professional preparation for teaching could be devised than to develop this participative type of college teaching in which students rendered concrete assistance in the making of the course. The new teacher must learn to work forward into new situations. Self-direction and independent judging are required. Some explicit practice in planning one's way through subject matter is deemed important. The ability to get hold of brute facts under the tutelage of the college instructor and to give them back again in the examination, is not fully adequate to the demands of scholarship for the future worker in secondary schools. Scholarship may include, implicitly, much that is desirable in respect to method in its best sense. But it is only the exceptionally alert student who is likely to detect the essential relations between subject matter and method, and to make subsequently intelligent application to teaching situations.

12. *The Need of Contact with Pupils as a Part of Professional Preparation.* Moreover, in view of the fact that college courses bearing the same title as secondary school courses should not be presented in the same manner either as to content or procedure, the argument is convincing that the college senior should become acquainted in a vital way with the work of high-school pupils before receiving approval to teach. A more definite type of professional preparation is therefore urged than that which might conceivably attach to a thorough-going scholarship. There is a distinct advantage in bringing the student of superior ability and promise into those intimate relations which are set forth in the plan of *directed teaching*. Explicit attention is directed to the movement of the subject and the movement of the mind. The interplay of forces may be gripped in concrete situations, a study of

which, and a vital participation in which, brings the student upon high-school ground. A practical, intentional, and critical experience is provided of a professional character which, it is believed, will prepare the would-be teacher for a more successful work than is otherwise possible.

13. *Justification for Undergraduate Professional Preparation.* However desirable it may be to have collegiate teaching of high order for all prospective teachers in the hope that thereby a genuine interest in teaching, as well as improvement in scholarship, may be assured, the fact remains that it is extremely difficult to develop professional ideals and interests without a deliberate direction of attention to the vocational side of preparation. This point is readily conceded in schools of engineering, law, medicine, and the practical arts. The number of those entering teaching with the intention of making it a real profession, for a time at least, is comparatively small, particularly in the secondary school. In the higher institutions interest is divided between instruction and research. The lack of interest in teaching is often due to absorption in research, although there is no valid reason for the contention that the research function, in itself, incapacitates a man for teaching. On the contrary, the essential quality or requisite attitude of mind, namely, the spirit of investigation or inquiry which lies at the very heart of productive research, ought to be a guiding principle in all teaching. Here, again, a mechanical separation between two major activities exists, whereas in a functional interpretation of both it would be found that a common core of principles should obtain in guiding procedure. The conception of *researching* might well be accepted as a basic principle in teaching. Such would be the case in thinking of teaching as direction for self-expression. The spirit of inquiry may very appropriately be regarded as the vitalizing element in real scholarship. If this view could be established in college teaching and carried over into the high school, the need of explicit attention to the development of professional courses would not be so urgent as it is at present.

Practical considerations, however, must be met. It is generally recognized that professional courses must be given prior to the graduate year. This policy is usually justified on the basis of

temporary expediency. The "traffic will not bear" the graduate year of exclusive professional preparation. Conditions are such in most of our colleges and universities as to require definite professional work in undergraduate courses, if the interests of students in this direction are to be subserved. In partial justification of this policy it should be recalled that scholarship is urged as vigorously by departments and colleges of education as by their academic neighbors. Moreover, the courses in education are in a way not devoid of content any more than pure academic courses are devoid of method. Some legitimate claim for high-grade scholarship may justly be made for an increasing number of education courses when conducted by teachers of high standing, although the avowed aim may be more strictly professional in purpose. A mere methods course, detached from any content whatsoever, would be an amusing discovery. The writer is not unmindful of the pretentious phraseology of the professor of pedagogy (unfortunately not yet quite as extinct as the dodo) who discusses what he is pleased to call the pedagogy of a subject of which he knows little. We are learning to do better things in better ways. Professional preparation of teachers has no doubt suffered most at the hands of its ardent friends. During the last decade many fruitful courses in education have been developed. They are winning their way and bid fair to rank in point of content with the academic courses of long standing. Scholarship, not only in the academic subjects but also in the newer education subjects is insisted upon as a prerequisite for teaching. It is not probable that the validity of the claims of the teacher of courses of a pedagogical nature will be readily accepted. The extreme view of the general cultural value of education courses may not be regarded as being significant in this connection; yet the proposition may be urged with some degree of seriousness that some of these courses dealing with the issues of public education in a democracy might conceivably contribute to both the cultural back-ground of our citizenship and also to the practical solution of the complex educational problems arising in every community in our country. It is hardly necessary to urge before this Society the importance of our own work. Our self-

esteem is being adequately enhanced with the increasing prosperity of schools and departments of education.

If, as stated above, the mechanical separation of activities that ought to be linked up under certain principles of functional dependence is unsound, it may be urged further at this point that the practice of acquiring first what is commonly called subject matter in terms of scholarship and then subsequently methods of pedagogy by which to teach what has been acquired, is also unsound. There may be adequate reasons for keeping together academic and pedagogical courses in the preparation of teachers, just as we find the situation in the education of engineers. In fact, the reasons for such a correlation are more obvious in the education of teachers than in the education of engineers. The engineers are not concerned with the study of the effect of the technical subject on the habits of students. They have no interest in the methods of learning, the problem of individual differences, etc. There is, therefore, a valid argument in the proposition that professional courses and academic courses should be paralleled. Even with the graduate year assured, this principle should be recognized as early as the junior year in college. Much, of course, would depend upon the sequence of professional courses, and the quality of instruction provided.¹

14. *Expert Instruction in Education Courses Essential.* The more crucial problem, however, lies before us: it is to develop within our higher institutions adequate facilities for the selection and preparation of teachers for secondary schools. The courses which are being developed and enriched under the stimulus of scientific education should be directed toward the improvement of teaching. Their ultimate justification will probably be found to lie in the direct professional contribution which they are supposed to make. A rating of mere academic order would tend to divorce these courses from teaching interests. It is a travesty, indeed, on teaching to have a course, designed especially for intending teachers, conducted badly. The direction of a course of definite professional bearing should be artistic as well as scholarly and

¹An illuminating paper is to be found on this line of argument in *School and Society*, Vol. IV, Oct. 28, 1916, p. 647, by Will Grant Chambers.

scientific. Good teaching, in other words, in education courses is imperative if results commensurate with the claims urged for them are to be secured. This means the development of a high order of collegiate teaching by college professors of education. It is superfluous to add that much remains to be accomplished in this direction. Little value is to be attached to a demonstration of "how not to teach." The new college instructor whose duty it is to assist would-be teachers in their quest should be alert to exemplify in his own teaching those commendable qualities which he would have them develop. Not that the prospective teacher is to be encouraged to follow any particular scheme or method which may be emphasized, but rather that he may be impressed with the spirit of good teaching to the end that unvarying loyalty to the profession may be promoted. As for the student who upon his own initiative becomes interested in the development of the subject matter of the course and studies the procedure employed by the instructor—the best collegiate teaching is none too good for him in the large sense of professional preparation for teaching.

15. *The Teacher in the Demonstration School.* Applying the same general method of description to the secondary school designed for demonstration and practice, it will be readily apparent that the teaching staff determines in large measure the character of the results. Only teachers of superior ability and energy can hope to succeed. All that is included in academic fitness and professional preparation must be evident. Here the teacher must be master of both subject matter and mind activity. Usable scholarship and teaching personality with unusual capacity for work and adaptability are prime requisites. Pupils must be taught in a superior way. The college senior is to be assisted within the class group in the practice of self-direction and independent judging. The presence of the college senior in the high-school classroom imposes upon the teacher a double responsibility. Subject matter must be constantly subjected to method, not by separation, but by explicit attention to the methods of mind in the process of education. The teacher is constantly made aware of the educational welfare of pupils. A good school is the first essential in the plan at Wisconsin. At no time are pupils intentionally given over to incompetent per-

sons. As stated at the outset, teachers of proved ability are responsible for the instructional work of the school. This obligation can not be escaped. If no additional requirement were exacted of the staff teacher in the Wisconsin High School, over and above that of rendering a conspicuous service in the one duty of teaching high-school pupils, that service alone would be an exacting one. To teach, not only with a view to promoting the higher educational welfare of pupils, but also simultaneously with a definite responsibility to the university student, would at first thought seem to be an impossible task. The difficulties, however, are not insuperable. Much depends upon the kind of procedure which is being developed in the classroom. Later some space will be devoted to a description of *directed study*, or better, directing classroom work, in which the laboratory idea is utilized in a large part of the class period. It will be observed that teacher, pupils, and student (college senior) constitute a working group in which a multitude of ways is presented for mutual helpfulness, cooperative thinking and doing, for directing work at one point or another, for assisting, in short, for manifold ways of participating in the activities of the hour. And, furthermore, the college senior is inducted into the procedure in such vital and responsible ways that his outside work for the class bristles with productive opportunities. The college seniors almost invariably take unusual pride in coming to the class not only fortified to meet the demands for brute facts but also with a notable resourcefulness and splendid initiative in ideas about conducting specific pieces of work and in directing activity to productive outcomes.

Once it is perfectly clear that the staff teacher is charged with the immediate responsibility of teaching boys and girls in the school, the manner of handling the university senior will be better understood. At any rate, practice teaching, as commonly carried on, is not provided.¹ Nor is the student merely to observe and thereupon

¹Q. Sanders: A Study of Professional Work as Presented in the State Normal Schools of the United States, *Ped. Sem.*, Vol. 20, 1918, p. 54. This author reports the experience of normal schools with respect to the effects of practice teaching upon the training school. "A strong minority see unmistakable evidence of deterioration when the student teachers begin their work. 'Too many personalities,' 'too much thinking for pupils,' 'want of concentra-

give an account of what he is supposed to have detected. The activities of teacher and pupils; the factors involved in the processes of teaching and learning; methods of work; the nature of the problem under consideration—its antecedents and general direction; *how* pupils work and *why*; results, and ways of appraising them; *what* to teach and *when*—and many more such complex issues—these are baffling problems for the teacher and little understood even by the supervisor of long experience. To stand without the veil and attempt to find out how the good teacher does it, will inevitably tend to superficial judging and to the accumulation of an assortment of devices without ability to see what lies back of them. The teacher in active control of teaching procedure stands in a strategic position for productive study and interpretation of the vital elements of instruction and development. The position of the critic teacher or the supervisor is likely to be external. Attention is directed to matters which are important no doubt, but in the nature of the case, only of secondary significance. Those more intimate and elusive elements affecting growth and movement, inner attention and the deeper currents of mental life in the educational process, escape the observer. If these primary factors in teaching are understood as adequately as such phenomena may be under any conditions, it is reasonable to assume that only those persons specially prepared for such work—teachers of unusual ability—can evaluate the work of the classroom.

16. *The Status of the College Senior in this View.* If the conception of *directed teaching* is valid, it would appear that the policy of fixing immediate responsibility in a competent staff is sound and it at once becomes the basis for the development of a plan of active participation by students preparing to teach. This, at all events, is the point of departure in *directed teaching*. How to assimilate the college senior into a group in which the cycle is

tion,' 'discipline more lax,' 'knowledge not definite,' 'continuity suffers,' 'unable to get as much work done as in good public school'—these are the injurious effects most frequently mentioned as arising from the work of student teachers.' In this study of 81 normal schools it is further stated that the number of opportunities given student teachers to teach varies by irregular gradations from a minimum of 30 to a maximum of 400. It is obvious that a variety of theories is held with respect to the amount and function of practice in our normal schools.

already complete from an educational point of view, and how to afford opportunities for a genuine and profitable experience in the nature of teacher-preparation for these additional members of such a group, are questions which are now to be considered.

Let it be understood, in passing, that no ulterior motive or any matter of practical expediency led to the adoption of the principles asserted above. The conviction is that *practice teaching* as such is inadequate and too limited for the prospective worker in secondary schools. The teaching of a brief number of lessons under rigid inspection fails to develop personal insight and initiative. What the student needs is critical experience in self-judging and self-direction. The apprentice idea may not be dominant in *practice teaching*, yet there is a strong tendency in that direction. Model lessons are a monument to the eagerness of certain educators for practical results. They rarely serve to develop the thoughtful, independent teacher. More fundamental preparation is necessary to an intelligent handling of pupils and subject matter. The mechanical use of ready-made devices, called *methods*, is to be deprecated. Teaching will be lifted to a much higher plane than now seems possible when ready-made subject matter or knowledge is radically re-interpreted and redeemed from a persistent, traditional formalism.

17. *The Pupils of the School.* Aside from the question of basic principles of procedure which are believed to support the plan of *directed teaching*, experience seems to show that pupils of high-school age are unwilling to be subjected to practice teaching in a "model school." Parents are eager to know whether the novice is to "try it out" on their children. They ask first of all that they be assured the best of teaching. The Wisconsin High School undertakes to give this assurance. No difficulty has arisen thus far in securing more pupils than can be admitted. Their attitude toward the college seniors assigned to their class groups is cordial and as a rule enthusiastic. The notion of *practice teaching* does not arise. The pupils feel that the school is conducted primarily in their interests and that nothing is denied them on account of the participation of university seniors. The management of the school has regarded this condition as being particularly fortunate and in

reality a fundamental prerequisite. Teachers and pupils are impressed with the school as their real achievement. No matter what extraordinary demands are proposed, the school must be protected at all costs, for without it there is nothing upon which to build a professional superstructure.

18. *Classroom Procedure.* It is impossible to give an accurate account of *directed teaching* without an explanation of the procedure in the classroom, the character of which is not being determined by the fact that the school was established and is maintained for the purpose of giving intending teachers concrete experience in the high-school classroom before going out to teach. Mention has been made frequently in the discussion thus far of the 'laboratory idea' and of a 'working group,' consisting of teacher, pupils, and students (college seniors). The term 'recitation' has been studiously avoided. The enthusiasm with which "supervised study" is being received throughout the country is indicative of a general dissatisfaction with the recitation system, based as it is upon unsupervised study. But, like many educational reforms, the tendency is to attach the new to the prevailing system, regardless of its underlying philosophy. Supervised study is in danger of being regarded as an external, purely mechanical device, the aim of which is accomplished by retaining the recitation system unmodified. This ought not to be the fate of so promising an educational reform. Merely to supervise pupils while they prepare lessons to be recited subsequently is futile. To extend the time of the class period and then arbitrarily divide it into two supposedly disparate functions, each of which is just as simple as the old practice, is frankly too easy. Fruitful educational reform requires something more than a mechanical shifting of conventional devices. No doubt supervised study has gained ready acceptance on account of the supposed, and for the most part obvious, futility of home study. Upon deeper reflection it would seem that the break-down of home study for large numbers of high-school pupils is to be attributed to the inadequacy of the recitation system.

19. *The Recitation System.* Dewey has presented the situation as it exists in the mechanically conducted memorizing school: "To recite is to cite again, to repeat, to tell over and over. If we

were to call this period *reiteration*, the designation would hardly bring out more clearly than does the *recitation*, the complete domination of instruction by rehearsing of second-hand information, by memorizing for the sake of producing correct replies at the proper time."¹

In considering the professional factors in the training of high-school teachers, Dean Russell emphasizes the need of examining with great care the prevailing practice in secondary schools. "At its worst, classroom practice may be merely hearing recitations or a demonstration of guess work with blackboard accompaniment. Teaching must not content itself with imparting information. Memorizing of facts or processes is of little value. Intelligent self-direction will lead teachers to do better work. Pupils must become self-directive and responsible."²

The following is from a recent address by President John Grier Hibben, Princeton University:

"The recitation belongs to an age when books were few and schools were established to impart knowledge and to test the learner's absorption of facts. To recite is to cite once more, to tell again, to repeat. The present age has little use for this process. It wants men and women who think, not who repeat what they have learned. Exercise in thinking is not gained from recitations as they are conducted in schools. A teacher prepares a lesson for the purpose of teaching it. This is not what is needed at all. It is a person to stimulate, inspire and direct the thought processes of children. The children have instinctive tendencies to inquire, to compare, to judge, to express. These processes make thinking.

"Much of the work done by teachers in school prevents thinking. Diagrams, pictures, stereopticons, rules as commonly used, all promote unquestioned absorption of ideas by children. When you are absorbing, you are not thinking. When you do too much, you become incapable of thinking at all. A teacher should not prepare herself to meet her class by mastery of a lesson. That is essential, but it is secondary. A teacher should prepare by realizing that she will come into the company of minds in which are pent up potentialities of action. What action is she going to

¹J. Dewey: *How We Think*, p. 201 (See Chap. XV). This entire volume presents an excellent basis for a productive re-direction of teaching with a view to the development of a problem-solving procedure.

²Russell: *Proc. Twenty-Sixth Annual Convention Assoc. Colleges and Preparatory Schools of the Middle States and Maryland*, 1912, p. 67.

direct? How is she going to direct it? It is not a good use of the hour for the teacher to test the knowledge of the children by having them repeat what they have gained from her or from books. The repetition of knowledge in the form in which it was absorbed is not a proper action with which to fill the school time.

"Years ago all the current theories of education repudiated knowing as the prime purpose of going to school. It is not the teacher's business to get children to know their lessons. That is secondary and necessary. The teacher who aims at that gets no further, and does not even effect her inadequate aim. The teacher must not rest content with being a mirror. She must be a provoker and director of thought. A boy must expect to come to the classroom as to a place of challenge to a combat of ideas. His innate tendencies are to think for himself. Formal and systematic education stifles his mind. The recitation of things learned, in the form learned, the repeated drill without new adaptations, new thoughts, kills mental power. The longer the boy attends the school the stupider he grows.

"Every staple subject can be treated as a basis for exercise in judgment, debate, mental alertness. The teacher must stop telling all that she knows and set the children to get it from her by intelligent questioning. The teacher must abandon the medieval function of final arbiter on all questions. The thing must not be true because the book or teacher says so. She must ask questions about which there is and should be difference of opinion. The majority of the conclusions of the world in social affairs must remain tentative statements. The tendency of the school is to dogmatism, unvarying decision and absolute truth. In this direction school can be seen to unfit its members for actual life."

20. *Directing Study (Supervised Study) vs. the Recitation System.* The purpose of this discussion is to develop certain principles which may serve to guide teachers in developing a classroom procedure more productive than the recitation system. Supervised study is conceived to be a means of organizing classroom activities in terms of self-activity and personal initiative. Much that is good in collective teaching will be retained. The main point is, however, a shift of emphasis from the recitation mode to education as direction for self-expression. Fruitfully directed study is more important than hearing lessons recited. The value of reciting what one knows has been much over-rated. Too little attention has been given to the development of productive habits of mind. Mere assimilation and accumulation of facts, no matter how well organized,

can not be regarded as adequate in the light of modern scientific thought. It is the use of information which is worth while. Pupils should be taught in a way that will insure the exercise of initiative and the development of ability to apply knowledge to new situations. Progress in the direction of realistic and genuine education is slow on account of the lack of clear perspective of the forces which control modern practice. Some educational reform involving a totally different philosophy from that which supports the prevailing system is discarded after a futile attempt to impose it upon the old order. Thus it is in the case of distinguishing clearly between the dogma of acceptance and the principle of growth in education. That which fits admirably into practice based upon one type of philosophy may not work at all under the other. Obedience, for example, is not incompatible with self-expression. A sharp contrast between the old and the new is contained in the following statement from Jackman, of the University of Chicago, in the early days of its School of Education:

“Responding to influences from without, life is an unfolding process from within. This is the conception that is now shaping our methods of instruction. The old recognized as training and discipline the so-called voluntary attention which seemed to be mainly the ability to stare, ox-like, a disagreeable, uninteresting or unintelligible thing out of countenance. The new believes in training and discipline that come from the pupil’s effort to follow up from premise to conclusion something which mightily interests him because of its worthy purpose. The new values attainment only as it represents a quality of mind that has acted through its own initiative. The old found satisfaction in a state of mind that was quietly receptive; the new sees hope in turbulence of inquiry; and all of these are irreconcilable differences in kind.”

The new procedure contemplated under the interpretation of education as growth in personal initiative and self-expression requires a new type of teacher. When lessons serve mainly as a means of controlling the home study of pupils the character of performance required of the teacher can easily be reduced to the rule-of-thumb methods. Question formulas of the *what, how, when, and why* order are applied to the content of a lesson with little appreciation of the object of the questioning process, and the tendency of the stereotyped teacher is to use patterns and neglect per-

sons. Many a teacher, or to be more exact, many a school master, suffers the mental constipation of a formula. This external mode of approach through ready-made subject matter and conventional methods is based upon unproductive formalism. The new school will require less reciting. The new teacher will indulge in less interesting talking, not to say lecturing. The pupil will be directed in the exercise of his powers by participating in a procedure of a laboratory sort in which all persons in the group are engaged in the work of the hour. In working out the contrast between the formal institutional procedure and the proposed directed-study group—a distinction as old as Pythagoras and Socrates when two opposing views of like nature were held—a student in a course conducted by the writer presented the following suggestive, if somewhat dramatic, response, which at least indicates a tendency to react with some originality. It seems good enough to include in this report. It runs as follows:

“Education is a drama in which the scenes are perpetually shifting.”

The Old

1. “Educational procedure is a tragedy. The individualistic non-conformists are the villains, who must be killed off before the play may reach its proper dénouement.

2. “Sometimes a comedy, often a farce, when viewed in the light of the revelations of the later examinations.

3. “The teacher, the *Star* performer; the children occasionally called to assist in the chorus, mostly ‘supes.’

4. “Play characterized by constant depletion of the cast, due to their inability to mark time in the chorus. This happens most frequently with grammar grades and freshman

The New

1. “A drama in which each actor may realize himself through his own active idealism.

2. “Not a reproduction, but a *production*. Not judged on the basis of how well he reproduced Hamlet, but how well he *created* Hamlet. Thus the examination comedy disappears.

3. “The teacher, the director, himself undergoing constant training. Stage carpenter, director of the orchestra, director of the play, but not official prompter. Knows the play—one of the actors—only occasionally in the leading role, and then to assist the play, not to appropriate the honors.

4. “Marking time not considered necessary. Not to get ready to do, but to *do*. Not can you *keep* time standing still, but can you *step* in time in the *march*.

high-school players. These culls often become the stars under different directors.

5. "When pupils are actually called into the play they are often so burdened with the problem of reproducing the lines entire and without change, and in accurately reflecting the tones, accent, and gestures of the director that spontaneous acting is impossible.

6. "Stage set. Scenery all placed. Curtain rung up on the same tableau and rung down on the same tableau yesterday, today, and forever.

7. "So absorbed in Scene II of Act I, that they forget to look for the plot."

5. "Actors produce the part; *Stamp* it with the impress of their own originality, unhampered by muddling officiousness of the director.

6. "Scenes shifting, each moment a fresh grouping. Action moving steadily forward to its climax.

7. "Not less interested in producing the fragment but seeing to it that it bears its proper relation to Scene III of Act V and all other parts of the play, and further seeing that this fragment sends forth its thread of interest which lasts until the ringing down of the final curtain, or beyond, if there be progress and evolution in the higher beyond."

Sufficient space has been devoted to the recitation system to suggest the need of something better. The bearing which this aspect of the problem has upon the preparation of teachers needs only to be mentioned to bring to our attention its importance. No amount of destructive criticism, however, will point the way to a more productive class period than could be expected under the old-fashioned recitation. If supervised study could be made the fulcrum upon which to redirect teaching under a new and vital conception of classroom activities in which the dominant idea is self-expression, it would seem to be logical that a new conception of teacher-preparation consonant with this idea should be worked out. The widespread interest in supervised study warrants an attempt to interpret its possible value and function. Furthermore, fruitfully directed study is emphasized in the Wisconsin High School, and the effort is being made to develop procedure in accordance with its underlying principles.

21. *A New Teaching Responsibility in the Directing of Study.* First of all, the conviction is growing that teachers themselves must

become increasingly responsible for the effective application of supervised study. The assumption is that habits of study are to be modified. Instead of telling pupils to go home and find out for themselves how to study, they are to be taught how to study. They are to be taught the value of books and other raw materials and how to use them. The class period is to be utilized for the purpose of directing activity in a forward way. One of the most hopeful departures in recent educational discussions is the evident tendency to formulate methods of teaching upon a study of the learning processes of children. A much deeper analysis is required than a mere external, quantitative description of a procedure intended to disclose habits of study. Something of psychological insight must be exercised as a permanent quality of teaching. A mechanical arrangement of hours in time-tables and of order of separate activities within the class period will not be sufficient. The disposition of the class period must be left to the teacher. It can not be arbitrarily divided between two or more activities each of which is a variable factor in a larger unity. The teacher's pupil-group is never static; every individual is growing and unfolding, and each at a different rate of development. The teacher must be free to modify details to meet the needs of a particular class or individual. Teacher and textbook are by no means infallible authorities, never to be questioned; gradually the pupil is taught to test by his own experiences and judgment new facts and interpretations which come to him. The teacher becomes more and more, not a source of information, not a purveyor of facts, but a director of activities, who points out the way in which knowledge and the evolution of knowledge can be attained for oneself.

22. *The Orientation of the New Teacher in Directed Study.* The technique of supervised study remains to be mastered. It is a process which perpetually begins; it is not some ready-made device. Its methods can not be developed and then reduced to algebraic statement. Directed and constructive supervision of teaching is the most effective means to be employed in assisting teachers to become directors of activities. In the professional preparation of teachers a beginning may be made, particularly in developing a point of view and in providing a practical experience in the de-

monstration school. Attention to learning processes as a basis for teaching procedure is a promising departure. Educational psychology becomes one of the most important professional courses. An examination of the methods which pupils employ in their work is essential. Teacher study,¹ that part of educational psychology which is intended to develop for the teacher a means of examination of his own learning processes, may be mentioned as a possibility for the improvement of teaching. To appreciate one's own intellectual habits in acquiring new knowledge or skill, to keep an account of one's own progress in some piece of learning, experimentally controlled, should contribute toward the solution of the problem of directing study. Economical and productive methods of work must be discovered, and pupils must be guided in the acquisition and employment of working habits which produce tangible results in the improved character of school progress. Supervised study, intelligently directed, should be the means of discovering to the teacher and the pupils how best to organize, select, and apply subject matter; how to study to the best advantage; how to distribute one's time and energy in the most effective manner. The incorporation of supervised study as a vital factor in the redirection of the recitation must find its justification in the effect produced upon the intellectual and moral habits of pupils. It should serve to develop the maximum working power of each individual. It may be made the means of eliciting the best from each pupil. A constant stimulus to excel is afforded under fruitful direction of classroom activities. A working group with varying individual attainment is conceived to be possible in all subjects. The procedure encourages each individual to discover economical and effective ways of attaining desired ends.

The function of the new teacher is mainly to assist pupils in raising problems which are to engage their attention. The very highest grade of teaching is required; guidance that is not 'crutching' expresses best the function of the new teacher. On the side of subject matter, interest attaches to the control of data that will give rise to problems within the reach of pupils of varying abilities.

¹C. H. Judd. *Genetic Psychology for Teachers*, Chapter I.

To guide pupils in the search of ends which to them are vital and realistic, emphasizes the value of stimulus and direction. The institutional teacher has been concerned primarily with the imposed task. The aim has been the accumulation of facts as ends in themselves, or possibly discipline with indifferent emphasis upon the content values of the curriculum. The methods employed to secure objectives of this sort have been developed upon the theory either of the memorizing school or the mind-training school. The recitation system belongs essentially to these types of schools. Excessive devotion to "hearing lessons recited" consumes the valuable time of teacher and pupils. The problems of class management which arise in a procedure of reciting lessons are totally different in nature from those which appear under the laboratory procedure. Pupils who know their work perfectly well derive little benefit from listening to futile attempts at 'siphoning' the failures. Moreover, there is a constant temptation to scold pupils who recite badly. A premium is placed upon verbal memory. The 'bright' pupil too frequently is the one who readily absorbs the printed page and gives it back with little or no independent thinking. It is not strange, therefore, that supervised study should be given a formal, institutional meaning and utilized as a part of the conventional practice, in effect merely substituting for home study a portion of the class period in which the teacher simply supervises pupils while they learn lessons to be recited subsequently in precisely the same manner as in the usual recitation practice.

What is needed is a new point of view. The class period should be conceived as a laboratory hour—a working period to which pupils come as to a place of challenge, of inquiry, of search. The teacher should be the director of thought and action, *not infrequently becoming the efficient consulting expert*. Surrounded by a wealth of raw material furnishing a basis for a problem-solving procedure, the pupil can be guided in a thoughtful employment of his powers. Guidance is more than supervision. Pupils are not to be made dependent upon the teacher, nor is work to be made easy, with no difficulties to encounter. Pupils should be assisted in planning their work. They need to be taught how to use their powers of observation, induction, and deduction in particular projects, prob-

lems, exercises, topics, and courses. There will still be need of discussion in class. Reciting becomes a secondary essential, in a procedure in which the problem idea is dominant. A kind of *discussion-method* may be employed in bringing together the results of the directed efforts of a working group.

The immature pupil in isolated home study too frequently energizes far below his optimum. He is likely to be confused as to the purpose and value of his efforts. While it is no doubt true that in outside preparation of lessons many pupils develop individual initiative and a certain independence in following up assignments on their own responsibility, it must be obvious that large numbers fail to make satisfactory progress. It is recognized further that home preparation of lessons for subsequent recitation in class has contributed to the development of mutually interpenetrating interests between the home and the school. Connections of a valuable sort are established in spite of the feeling which often finds expression in the charge that parents and tutors (with or without compensation) are required to do the teaching, while the instructional staff merely assigns and hears the lessons under the recitation system. The procedure suggested in the interpretation of supervised study in this report undertakes to reverse in a large measure, the preparation-recitation order. In the redirected class period the pupil is to know at once whether he is working along fruitful lines. What he does is checked and evaluated not only by individual oversight but also through the cooperative efforts of pupils working together. He is taught to examine data for himself, to think his way through by the use of *organizing principles*, to arrive at conclusions for himself, and to submit his results to the scrutiny of the group in which he is working.

23. *Teaching, in Terms of Individual Differences.* The essential feature of the new class period is the procedure of working forward under the stimulus and direction of the teacher. It may be described as teaching with prospective intention, in contrast with an institutional procedure based upon retrospective intention. The subject material employed in this departure may not be radically different from that commonly used in the recitation system, but the nature of its organization and method may need to be radically

changed to meet the new conditions. The unit of teaching requires special attention and will be discussed in a subsequent paragraph. The emphasis on the method side should be shifted. Out-of-class study should be wisely continued, particularly in the senior-high-school grades, the purpose of which, however, will not be primarily that of preparation of assigned lessons for subsequent recitation. An adequate account of the pupil's progress and attainment may be obtained by checking results and by testing for understanding and facility in further application of principles and subject matter. The efforts of pupils under the new procedure will be evaluated more and more in terms of ability to go forward, ability to make fruitful and effective application of knowledges and skills. Application in this connection refers mainly to learning processes in which a way of thinking is gripped and then used in handling new data and new situations. The cycle is usually carried forward within a given set of relations in which use is made of organizing modes of thought. Cross-connections are important, and pupils should be encouraged both in discovering and in using them. Practical demands are ordinarily conceived to lie in this direction. But it is not the full account of application, educationally speaking, to limit its meaning to the narrowly practical. Application in learning processes suggests ability to use facts and principles, modes of thought and skill, in handling new data within related fields of subject matter or specific courses comprising fairly compact divisions of subjects. The emphasis is placed upon ability to use one's powers in the mastery of new problems.

Obviously vitally directed study is designed to replace a large part of the old-fashioned recitation and to change the character of home study. In the more or less formal presentation of a new unit of instruction under class teaching or a developing study lesson, the aim is to engage the active attention of all pupils of the class group. Teachers readily discover wide ranges of variability in performance as soon as pupils are given a set of exercises or questions to be worked out under the immediate supervision and

direction of the teacher.¹ At once directed study reveals the problem of individual differences. It is well-nigh impossible to bring together sections of pupils of like abilities. Even in the large high schools administrative difficulties are met which practically eliminate such sectioning of classes. Pupils of varying abilities must for the most part be handled in a section class. The problem is to teach all the pupils in such a group. There is no such condition as the "pupil level." The teacher must recognize the fact that there are individuals to deal with at all times. New pupil levels are constantly being disclosed. Only the static teacher absorbed in the process of transferring, by a set of mechanical methods, ready-made knowledge from the text where it is supposed to be, to the receptive minds of pupils where it is not, can think of an "average pupil level." The top third of the class in our schools has received comparatively meager consideration. In fact, no school has yet been devised to teach the emerging top third or fifth of a class. The class period for these individuals is for the most part barren and unprofitable. They derive comparatively little benefit from a system which reduces all to the monotonous pattern of John Smith. The remedy does not lie in the direction of some administrative device by which the supernormal pupils—some 5 to 10 percent of the total number in class—are to be separated and given special advantages. The next group just below will require special attention also. In short the only solution of the problem is to teach all pupils of a given class group under a procedure that allows each individual to attain his highest level of working power. The tendency is to teach down to the level of the lowest third. In the illustration in C, page —, an assignment of 20 problems in that exercise in algebra would be considered a fairly difficult and adequate task. Yet in 40 minutes of directed study 15 pupils of the 25 solved more than this number, and 3 solved 45 to 50 problems. These problems, it will be remembered, become increasingly difficult toward the end of the set. Similar data could be arrayed in the

¹How to conduct work in foreign language study to meet the problem of individual differences, see Deihl on Individual Differences and Notebook Work in Modern Foreign Languages,—*The Modern Foreign Language Journal*, Vol. I, p. 52 ff.

case of original exercises in geometry, showing that the top third or fifth of a normally selected group of pupils can turn off three to five times as much work as the lowest third of the class. Rates of translation in Latin and German vary in substantially the same way as in the case of silent reading in English. (See D, page 49.) Pupils in English composition do not produce their written work with anything approaching uniformity of speed and quality. Those courses which can be organized under the project idea, such as manual training, offer excellent opportunity for a study of individual rates of progress. These facts should modify profoundly the character of home study. The opportunity for testing the capacity of pupils is constantly presented in a procedure which directs energy towards producing results in a forward-moving undertaking. Each pupil is brought under a challenge to work; competition is strong; rivalry gives life and vigor steadily.

Courses in education dealing with principles and methods of measurement are coming to be recognized as indispensable professional equipment for the adequate teacher. A functional outlook upon measurements applied to daily classroom work enables the teacher to direct activity in terms of individual differences. The differential idea clearly perceived in and through self activity introduces a new basis of education upon which trained individuality may be expected instead of deadening uniformity and sterile iden-

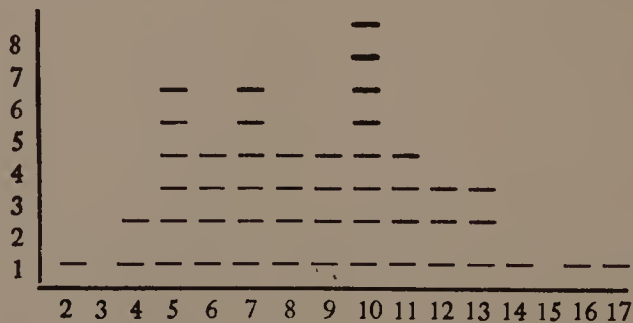


Fig. A. Test in Arithmetic. 48 eighth-grade pupils. Relative frequencies of numbers of problems solved in a given time. Base line represents the number of problems solved; vertical line, the number of pupils, *e.g.*, one pupil solved 17 problems, while another solved 2. Eight pupils solved 10 each; three, 4 each; four, 13 each, etc. (From Courtis).

tity of opinion. These illustrations¹ are listed merely to suggest unlimited possibilities of paying attention to individuality within

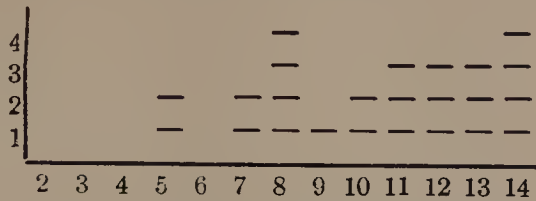


Fig. B. Similarly—a 5 min. speed test on number 36 of the Studebaker Economy Practice exercises. 22 pupils in first junior-high-school class. Four pupils solved 14 problems correctly, while two pupils solved 5 each; four, 8 each, etc. (Wisconsin High School).

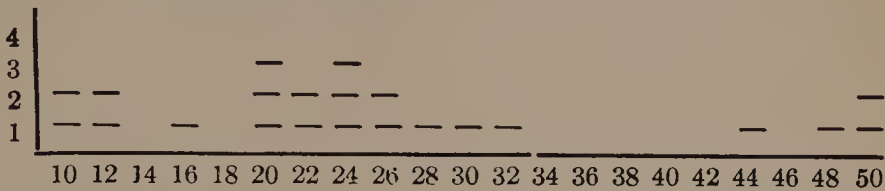


Fig. C. Represents relative frequencies of numbers of problems solved in 40 min. by 25 pupils in a class (Wis. H. S.) in algebra. Exercise preceded by 10 min. of class teaching—a new exercise in factoring. Two pupils solved 50 problems, while two pupils solved 10, one pupil, 16, etc.

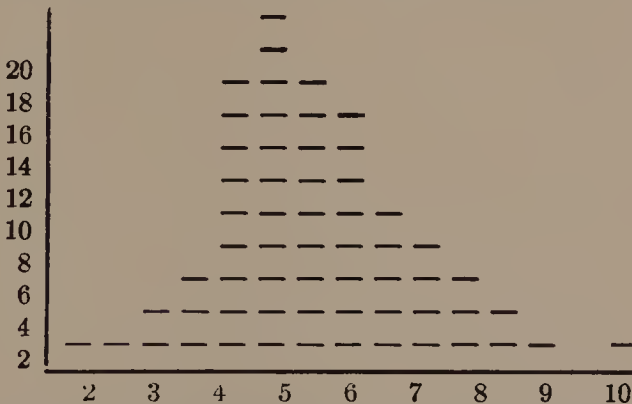


Fig. D. Rate of silent reading, new material, comparable to that of Silas Marner. 109 pupils of eleventh grade. Base line indicates the number of words read per second—the half being understood between the several digits. The vertical line represents the number of pupils; e.g., one pupil read at the rate of 9 words per second, while two others read at the rate of $2\frac{1}{2}$ words; twenty at the rate of $4\frac{1}{2}$ words, etc. Problem: Relate this type of analysis to home reading in English courses. Should all pupils of a class section be required to read the same number of books of like proportions?

¹See D. Starch, *Educational Measurements*, Chap. IV, V, VI, for a general account of the study of Individual Differences.

such collective teaching as may be required in terms of organizing principles.

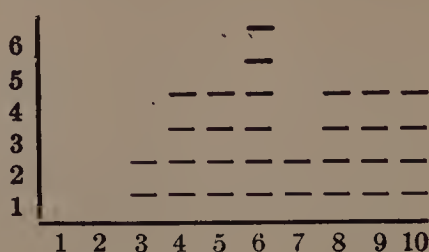


Fig. E. A class of 27 pupils in geometry worked for 50 minutes on a set of original exercises with the results indicated. Two pupils solved three problems, while three others solved ten, and so on. The median for the group in this exercise is above 6 exercises. (Class in the Wisconsin High School, January 12, 1917).

24. *The Problem of Out-of-Class Study—Home Study.* How to secure individual instruction, or better how to develop personal initiative and insight under a scheme of class instruction, has seemed to be fraught with insuperable difficulties. In fact, the prevailing practice would seem to indicate that uniformity is the central aim. It is proposed in the plan of a directed-study group to combine class teaching and individual teaching, paying attention to the needs of pupils of varying rates of working capacity. Home study must be redirected in a corresponding manner. It might very appropriately be described as “unfinished business” and therefore a kind of work adapted to individual needs, instead of a supposed uniform assignment of so many pages or problems to be mastered by all pupils alike. No matter what the external appearances of uniformity may be, wide ranges of differences in application, progress, and attainment are inevitable. The problem of individual differences extends to home study just as specifically as to the procedure in the class period. That which is accurately taught in class and partially worked out there may be made the basis for further elaboration and search out of class. Much work begun in class needs to be refined and verified—the writing of laboratory notes, reading of source material or illustrative matter, reducing to a finished form a theme or a section of translation in a language roughed out in class under stimulating direction, working forward in exercises designed to develop certain organizing

principles, and many other definite forms of work to be continued. After pupils are taught how to study under intelligent guidance, when the direction of the searching has been determined upon by means of thought-provoking questions and problems raised, the nature of home study can readily be understood and developed. Reasoning is not only made easier, but also for the great majority of pupils made possible and genuinely promoted by developing explicit methods of attack, by schematizing the search, in short by directing the educational process with clear purposes and definite objectives from day to day.¹ The ideal is to have the pupil leave the classroom each day with a desire to go forward in the work already begun under the stimulus of challenge and rivalry, if not with a keen sense of values and a delight in experimentation. The boy of 15 who systematically devoted one to two hours to the study of *his* geometry at home not because he was required to do so by his teacher, but as he himself stated it, because he wanted to see what he could do with the thing, had reached a high plane of intellectual interest—one not impossible for many more boys and girls than we have supposed.

It is not to be inferred that home study is to be made optional with the pupil. On the contrary, definite standards of work must be presented and insisted upon; pupils must be made aware of their responsibility in meeting them. The pupil is expected to furnish evidence of application in the character of work turned out. A certain minimal requirement in terms of organizing principles serving as a means of directing work must be met within a given time in order that class teaching may be conducted. Goal ends or objectives are essential to progress. They must be defined; pupils must learn to work purposefully toward the attainment of these ends. The directed-study procedure, with a class period of sixty to seventy-five minutes each day, assures in addition to fruitful direction of activity, a high degree of regularity of study. Uni-

¹“It [reasoning] is made easier (1) by systematizing the search, (2) by limiting the number of classes amongst which the pupil must search for the right one, (3) by informing him of classes which include the right one and which he would neglect if undirected, and (4) by calling his attention to the consequences of membership in this or that class.” Thorndike, *Principles of Teaching*, p. 163.

formity of results must not be expected for the obvious reason that the school is dealing with individuals. As stated above, a uniform assignment for home study by no means insures uniformity of preparation either in time devoted to the task or in quality of effort. Any attempt, therefore, to develop a procedure which is intended to put a premium on individual initiative and growth in self-directive capacity can be justified in so far as the fact of variability is concerned. Qualitative differences in habits of study and attainment could hardly be made more variable by design than existing practices disclose.

With the development of larger teaching units than the conventional lessons for each day, the nature of home study takes on a new meaning. The need of further study is emphasized in terms of ability to meet new situations, problems, questions. The mastery of essential matter upon which the new situation is based is constantly made purposeful by its use. The pupil who is developing this functional view of study is more likely to take an interest in further pursuit on his own initiative than would be the case in the recitation system. It is sought, therefore, to establish for the pupil concrete and genuine reasons for study both in class and at home. The out-of-class work conceived as "unfinished business" enables the adequate teacher to employ incentives of appropriate sort, in keeping with the spirit of this general procedure. The class discussion, examination, checking of individual work, gripping the new piece of work, performance at any time, reveal to the pupil his position in his class group. If unsatisfactory progress is shown under any form of testing for power or results, the teacher, in conference with the pupil, can assist him in formulating a plan for improving the character of his work. At no time is the pupil to be left to shift for himself. Work begins in class under stimulating environment, and intelligent work is to be continued out of class. *What each pupil actually does must be regarded as indeterminate.* A mechanical requirement imposed by the school has not secured a productive form of home study from those pupils who should devote themselves most arduously to the task. It should be clear that the motives for home study in the plan of directed study grow out of the activities of the class period. To illustrate,

a set of exercises in mathematics or science, a topic problem in history, a section for translation, may be entered upon by the class—all working forward under guidance, with or without class discussion, and each pupil making such progress as he can toward attainable and definite objectives set forth from time to time. The composition in English courses may be started in class, the material for a certain type of story assembled and perhaps organized or even reduced by a few pupils to the finished product. Out of the activities of pupils working forward with prospective intention and arriving at different levels of attainment, the problem of home study emerges as a distinctively individual problem. Its indeterminate character is frankly recognized, and attention is directed to meeting the situation in terms of individual needs.

25. *A New Pupil Attitude Toward School Work, College Senior Included.* If, as alleged, directed study operates to encourage individual initiative and to promote growth in self-directive capacity, whatever practice tends to develop substantial 'encouragers' to excellence should receive careful consideration. The new teacher, as director of activity and provoker of thought—not infrequently the consulting expert—must know how to use judicious praise. Boys and girls of high-school age respond admirably to 'temptations to excellence' in all sorts of work and exercise. While a superficial examination of pupils may lead to the belief that they have little concern for good work, a deeper analysis of their attitude reveals a splendid regard for the best things, intellectual and moral. Moreover, they are lovers of work. The apparent indifference of many pupils is due, in part no doubt, to a mechanical and traditional procedure which fails to make school work real and vital to them. They have interests often in out-of-school work in which they display excellent qualities of energizing and of responsibility. The cultivation of intellectual interests and personal responsibility in pupils is one of the artistic functions of the good teacher. High-grade work is appreciated. The pupil who does a conspicuous bit of work should be rewarded. In the wholesome rivalries created in working forward, explicit attention should be directed to ways of giving recognition to pupils who by their work merit particular praise. It may be abundantly sufficient to have

the simplest word of approval from a superb teacher such as "exactly," "yes," "well done," in comment upon a fine piece of work. Genuine commendation given at opportune times, is extremely important in contributing to the development of wholesome attitudes toward school work. Judicious praise should not be denied the pupil of mediocre ability; earnest effort should be commended with frankness and sincerity.

Something more than casual remark of this sort may be sound in practice. It is not mere fiction to argue that boys and girls may be impressed with the idea that it is a privilege to appear before the class to present a fine piece of work. Bearing in mind that the essence of directed study is the conception that the class period is a time for work, and that every pupil is to be engaged the entire period in fruitful activity, it requires no argument to show that the individual who is given the opportunity of occupying the center of attention should not waste the valuable time of his class. Pupils are capable of appreciating the advantages of application in this type of class period. A high level of merit is attained when pupils become impatient in being required to put aside their work to listen to the presentation of a shoddy piece of work or to an uninteresting recitation. Every subject offers frequent opportunities for the consideration of the worthy achievements of pupils—when, for example, the teacher says: "Here is an excellent theme: it is good enough to be read to the class: let us have it read." A difficult problem in science or mathematics has been mastered and the teacher calls for its presentation to the class. It may be an original exercise not included in the required work of the course. After careful study a pupil may be able to render in good English a selection from a foreign language study. Reports of various sorts in connection with school work may be given with a view to encouraging and rewarding pupils. Projects in the constructive arts may be used for purposes of stimulating interest in fine workmanship. Special attention to matters of this nature serves to promote a feeling of pride in good work. The opportunity to present to one's class a special piece of work on the basis of conceiving such practice as a kind of dignified rewarding is regarded a stimulus to challenge of the best type. This procedure applies with peculiar force to the

college senior participating in the work of the class. He, too, must be impressed with the importance of making a conspicuous record in actual work of the course in which he is competing with pupils.

The directed-study period is devoted mainly to those activities which call constantly for individual application. Any pupil of the group, the teacher, or the college senior, who undertakes to hold the attention of the class, or better, direct attention to profitable ends, must have something to say, an effective way of presenting it, and most of all a genuine desire to do so. These are attainable objectives; they are worth cultivating; the accomplishment of them gives new directions to classroom activity. When it is realized that a working definition of the laboratory idea focuses attention upon producing results in the class period, and further that pupils are rated on what they produce, the value of each working period will be appreciated. The importance of demonstrating to the class, ability to go forward is readily seen. No one in the group is permitted to consume the valuable time of others in unprofitable discussion. This point of view is capable of large development. Pupils are quick to catch the spirit of the new departure and with a little encouragement will find ways of expressing disapproval of faulty work. An indifferent pupil must face social criticism. He can be told frankly that the time of the class is altogether too valuable to listen to a careless and thoughtless presentation or discussion. By contrast, such a pupil may be brought to a keen sense of his level of energizing. No "perfection" standard is set up. The nature of the subject matter and the procedure may be such that practically no pupil need fail to rise, now and again, to a level of legitimate social approval. This statement may seem entirely too optimistic. But when the fact is realized that many of the failures in the high school are among those who make no serious attempt to prepare lessons, and thereupon get little out of the recitation, it must be clear that systematic directed study each day is in itself reasonable assurance of substantial improvement.

26. *Preparing the Way for Appearance of the College Senior in Teaching Rôle.* Occasionally, a pupil of proved ability may be given recognition of extraordinary sort. He may be permitted to

assist the teacher in checking results or in presiding over the class during a discussion, acting as referee or even at times directing the work. This is a dignified position, and, if properly managed, it can be made to contribute to the development of qualities of leadership, responsibility, and self-control. It is a practice, too, which gives the teacher an opportunity to become one of the group by taking his place with the pupils. Responsibility for the conduct of the work of the class is thus shared by the pupils. The elements of leadership are recognized and, in accord with the spirit of democracy, those fit to lead are given a chance to emerge out of the class group. The school is made a realistic institution. Mutual helpfulness is encouraged. The 'pedestaled' teacher, sitting aloof and apart, is eliminated. Personal responsibility is cultivated. Much that appears in the institutional school room—questions of formal class management and matters of conventional methods—either disappear or become less than secondary essentials. The procedure which definitely rewards pupils who excel by enlisting their energies on the basis of mutually shared interests tends to promote cooperative thinking and doing. The so-called "socialized recitation" is a recognition of this principle. The teacher, at no time, is relieved of full responsibility for the proper direction and control of the class. There are, however, many fruitful ways of exercising this responsibility. In fact, its highest expression is attained when the student becomes fully self-directive and responsible. Gradually the teacher is to make himself less necessary to the student. In approaching a limit in this direction, it would seem logical to suppose that exercise in self-direction and the cultivation of individual responsibility should receive attention in the high school. The responsible, self-active person is not developed by being told to go off by himself, practice self-control, cultivate responsibility and develop capacity for anticipated leadership.

27. *Recognition of Principles of Social Psychology.* We can not set the pupil off and talk about his mental machinery. Social psychology means, literally, that personality is quite as much a function of one's neighbors' activities as one's own brain. The philosophy of pragmatism has been at work in education long before it became an *ism*. It is expressed in terms of 'problems' and

'self-activity.' The final court of appeal in all thinking is value in a social world. All subjects of the school curriculum are in reality a series of social problems. Their history goes back to this social aspect, which in the wider sense is the practical. Subject matter conceived as finished and therefore static, because approached as ready-made knowledge, gives the individual no share in working out ideals, whereas the view of an evolving world—the constructive idea in education under which subject matter is conceived as fluid, is suggestive of the social standpoint. Each individual is to have a voice in shaping content and in working out the development of new forms and laws. The curriculum has no meaning except in terms of the active agent. The pupil is a botanizing or geologizing being. So it is in all subjects of the curriculum. The process is a developing one. Opposed to this conception of growth and self-expression is the doctrine of a fixed order, imposed by some authority, under which the individual is expected to help in a mechanical way in the execution of a pattern or formula. The conventional type of education which trains children to docility and unthinking obedience, regardless of where they lead, is not suited to a democratic society in which responsibility for the conduct of government and institutions rests on every member of society. The high school must develop active qualities of initiative and independence for the great majority of citizens. The fact that needs to be emphasized is that any kind of freedom worthy of the name must be bought at a price; it is the price of discipline. For all who escape the death of attainment there is no real freedom, intellectual or moral, at a price lower in the scale of human values than discipline. Increasing power in self-discipline is the vital point in the cultivation of a feeling of responsibility. Pupils who simply take orders, who do things simply because they are told to, receiving no practice in acting and thinking for themselves, are not being adequately prepared for a self-directing and responsible life. The directed-study group as described in this report provides many opportunities for the individual pupil and the college senior to participate in the direction and control of the work of the class. Each person is regarded as an active agent, sharing in various ways responsibility for the development of the subject in hand.

The probabilities are that there would be no marked dissent from the general thesis of pragmatism and self-expression in so far as a statement of principles is concerned. There is valid ground for the contention that education should increasingly develop the responsible person. A democratic society requires, first of all, an individual trained to estimate his own powers and limitations. He must become a good judge of his own opportunities. On the theoretical side, at least, there is substantial agreement that that discipline is best that comes "from the pupil's effort to follow up from premise to conclusion something which mightily interests him because of its worthy purpose." In making provision for greater flexibility in the conduct of the class period and in deformatizing the usual recitation procedure, the rigor of discipline and the insistence upon accuracy of scholarship need not be diminished; in point of fact, a more productive form of application is readily perceived, increasing as the value of attainment is determined more and more by a "quality of mind that has acted through its own initiative" under the social stimulus of a working group.

Apprehension that directed study telescopes accuracy of information, discipline, and memorizing is not well founded. An accurate accounting of the pupil's efforts is not omitted. It is active and purposeful memorizing that is emphasized. Testing through using facts and principles in meeting new situations and problems is deemed more important than a mere rehearsal of subject matter, the main purpose of which is to determine what the pupil knows or to ascertain how well an assignment has been mastered. The fear that pupils will not be held to account for work required of them is largely imaginary. There is no escaping responsibility. Every class period is a time of testing. The pupil is required to furnish tangible evidence of ability to go forward by making use of whatever facts and principles are essential to adequate handling of new situations. Moreover, definite checking of any kind of assignment of work is germane to the new departure. What may be denominated as the 'discussion method' constitutes an important part of the development of subject material. No arbitrary fractional part of the class period should be set apart for any one unvarying practice. In all subjects definite cores of

interests may be organized. After a careful study has been made of some topic in which problems are raised, and data examined and organized, the results of several hours of work may be presented in class through the discussion method, rapid questioning, debate or topic presentation. Here, again, the point is urged that directed study should precede discussion in order that material may be organized in comprehensive units of subject matter. The aim is to have pupils work out certain principles, bringing together data of adequate and vital sort for discussion, thereby furnishing a basis for a profitable and effective presentation. The importance of accurate information is emphasized in the effective manipulation of questioning, presentation, and argument. Pupils are impressed with the value of preparation in meeting a challenge. Their ideas are chastened when thrown into the crucible of discussion. Such testing need not be conducted every day. There is no rigid formalism to be observed. Any procedure that encourages a mechanical conformity to certain devices should be condemned. Going through the motions of teaching, repeating a kind of ritual of education, is stupid performance. The fundamental conception of directed study is its indeterminate character in respect to external and quantitative matters. This view is frankly expressed because education deals with individuals. The mythical 'average pupil' must be discarded along with the static conception of subject matter. Teaching must remain inventive all the way. The general direction must be determined. It is not the road that determines the city, but rather the city that fixes the general direction of the road. The character of the road depends upon conditions that must be met. The alternatives are, as a rule, matters of judgment to be exercised as the road is being constructed. At all events teaching that approximates the ideal of a professional undertaking imposes upon the teacher the obligations that belong to the artist. The effect of one's efforts must be evaluated in terms of the results produced, not by conventional standards or ready-made devices.

28. *The Pupil, the Educative Unit.* The movement to organize educational procedure on a social basis does not imply any form of social organization that leads to stratification of pupils. An unobstructed opportunity must be safeguarded to every nor-

mally constituted adolescent. The insidious forms of caste which would in any way socially predetermine the status of any group of American youth must be kicked out of our public schools and kept out forever. The attractive arguments of a material efficiency must be scrutinized with a searching of the underlying principles which have guided American educators in the development of our educational ideals and practices. In the large high school the attempt to classify pupils in a given subject according to ability is sometimes made. Obviously this can not be done in the small school, however desirable such practice may appear to be. The accelerant-group idea is an attractive theory. Under collective teaching and the recitation system pupils in a given subject differentiate rapidly into two or more rather clearly defined static groups. The immediate temptation is to classify pupils under conventional labels, as bright, less bright, and dull pupils. The effect of such classification upon pupil and teacher is not altogether wholesome, although it may seem to be an efficient method. The C pupil, once labelled, is usually a discouraged pupil. Moreover, any group or section of pupils must within itself inevitably develop wide ranges of differences. Logically, the scheme of classification can not be made a success with a division of classes only into accelerant and ordinary sections. The advantages are at best only relative. Any classification presents the old problem of individual differences.

With the pupil, and not the class, as the educative unit, the argument for classification is not so obvious. The pupil has no static position in his group, when teaching concerns itself with directing activity by creating situations to which pupils and teacher react under a problem-solving procedure. Each pupil has the opportunity of working up to his best. No one of the top third is limited by the presence of a pupil perchance in the bottom third. The fact that one pupil solves fifty exercises in algebra while another solves only ten, both working under the same organizing principle, does not support the view that these two pupils should be separated. The main point is to have each working up to his best ability. The indeterminate assignment idea must find a practical application in this new type of classroom work. The problem does not consist in fixing a minimal content for the class as a whole, but

rather in developing clear perspective which sets no upper limit for any pupil. The adequate teacher needs to think of extending the scope of initiative. The problem becomes increasingly one of finding abundant raw material to meet the challenge and needs of pupils *at work*. Wide use is made of supplementary texts and library, together with laboratory material and original problems and questions. The heart of supervised study lies in making the class period productive for every pupil. This end can be attained by having each pupil work up to his maximum throughout the class period. The recitation system develops a receptive pupil: one who spends the hour in listening, absorbing, paying attention. The plan of directing study keeps each pupil at the "fork of the road" with a problem or question to be worked out. Each pupil is using information, principles, knowledge, in thinking his way through exercises of one sort and another, or in constructing a story, theme, or report. It is to be expected that pupils should work at different rates. One commits ninety lines while another in the same class commits fifteen lines; one translates fifty lines while another translates twenty lines; one writes a half-dozen stories while another is struggling to turn off one, etc.; and who, after all, does the best? Is it not a question of each measuring himself against his own record? The problem for the adequate teacher is to direct activity. Boys and girls become competent assistants in the proper direction of energy just as soon as the repressive measures of collective teaching are removed.

The pupil as the educative unit does not imply that the ideal situation would be to have a teacher for every pupil. On the contrary, the large class can be handled more productively under directed study than under the recitation system. The conclusion that the pupil is singled out and thought of in isolation is a gratuitous misapprehension of the essential principles of supervised study. Under the recitation system the pupil is thus singled out. The average time for each pupil before the class in the rôle of reciting is about two minutes a day, whereas in fruitfully directed activity every pupil in the class is working up to his maximal capacity. The socialized recitation partially describes the new departure. How to secure full participation of all members of the class is the

central problem in directing study. Discussion is essential. Instead of reciting a common assignment—a minimal essential content—profitable discussion is promoted when each pupil has worked out something of his own to contribute. The pupil in the bottom third should be given an opportunity to contribute something which his superiors have not done. In developing a new principle as a tool for further thinking and use on raw material, all pupils are engaged in a common enterprise. No time is wasted in mere reciting ready-made answers to ready-made questions.

The 'set-lesson' assignment fixes the upper limit by definite specification. The question is seldom raised; How much more could the upper third of the class accomplish under direction and stimulus in teaching and procedure the aim of which is to develop maximal power? Giving extra credit for additional work beyond a minimal assignment for all is a recognition of the need of making provision for the more capable pupil. The indeterminate assignment idea aims to assist each pupil to organize his working powers up to his best.

The contention that some ten per cent of the pupils in our upper grades and high school are supernormal and, on that account, should be segregated and given opportunity for unusual acceleration is an attractive theory, but hardly adequate as a solution of practical educational problems. The difficulty of caring for such pupils in the small schools is at once obvious. The means of determining who belong to a supernormal group would be crude at best. Moreover, the 45 pupils of every 50 remaining after the 10 percent are segregated present the original problem of individual differences. At the top there would be emerging another group of supernormal persons, raising again the same situation calling for segregation. The process would be repeated in each attempt at sorting.

With a teaching procedure which places the emphasis upon directed study, work is initiated in the classroom and continued outside as unfinished business. No upper limit is set for any pupil. The assignment may be just as definite under an indeterminate plan as it is under a set-lesson plan with so many lines, exercises, pages, for all alike in home study.

The attempt to operate a system which aims to have the capable

pupils in a class do an extra amount of work, receiving additional credit therefor, does not seem to be adequate. Some essential factors in the learning process are disregarded, particularly the element of cumulative power. The 'fine points' of the game are mastered unevenly. For example, in geometry one pupil may find the subject confusing at first, yet within six or eight weeks he may develop clear thinking and excellent form, while another may find his experience quite the opposite. It is difficult, too, to give proper weight to effort. One pupil may expend as much time and energy in committing 15 lines as another in committing 150 lines. It is perfectly easy to measure the results of these two performances if mere counting of lines as units is all that is required. Only clerical ability is needed in arriving at a conclusion. Variable credit for mastery of different amounts of subject matter in a given course encourage a formal, mechanical evaluation of effort.

The supernormal person presents a totally different problem from that of the defective child. Segregation of the latter for special educational treatment is a justifiable practice and meets with social approval. The welfare of the child is thereby conserved and the school is relieved of a serious handicap. The determination of the defective child is by no means a simple procedure except in the more aggravated cases. When the border line is approached, grave difficulties are encountered, not the least of which is a social consideration. The selection of supernormal pupils and their segregation can hardly be regarded as comparable to this situation. Their presence in a class group is in every way helpful, or at least can be made helpful to the other members of the class. Assuming that supernormality is a permanently fixed quality and that means are available for its discovery, the desirability of segregation of the top 10 percent of the pupils of a school system is not readily conceded. There is in such a scheme a kind of pedagogical predestination which runs counter to our conceptions of democratic education. The practical situation, however, is much simpler. There is no line separating the normal from the supernormal. Genius and marked ability are not disclosed unerringly at any particular age. Education is supposed to effect changes in the persons brought under its procedure. The conceptions of self-realization and of

emerging powers and of growth in personal initiative are germane to the ideals and practical outcomes of secondary education. In other words, supernormality is not a static quality, but rather a functional aspect of growth. In so far as the school is concerned in the process of building the person, this quality may be regarded as one of the possible outcomes of education.

This phase of our study may be carried into any high school. Groups of pupils are found who are selected with respect to curriculum interests, advancement, ability to carry successfully certain courses of instruction. A given class group presents its various problems relating to the individuals composing the group. No reliable data can be had by which to forecast with any degree of exactness the relative positions which these individuals will take in the course from time to time. No one in the class is predestined to a certain measure of success in geometry, history, physics, English, etc.

Each pupil is to have every possible opportunity to develop his maximal powers. Differences are inevitable. No two persons are conceived to be equal in working capacity, ability, and interest. The requirement seems clear; it is that the school shall provide equal opportunity for growth and progress, by developing a procedure in which each individual, treated as a person, may go forward at his own best rate. Instead, therefore, of segregation or division according to some standard which seeks to classify prior to a testing out in a course or grade, *i. e.*, by *imposing* a separation on the basis of any sort of educational, social, or mental predestination of pupils, the principles of education in American society would seem to specify that our public secondary school shall deal with such groups as we find under normal conditions of promotion and sectioning into the various courses of instruction, and thereupon discover ways and means of directing activity in a manner that will assist each pupil to realize his best. This common principle is based upon differences in capacity. At once, it is recognized that uniform progress is impossible. The differences in capacity, in skill, in organizing power should become progressively greater rather than less, in the development of a course.

It has been shown in the manipulative skills of certain occu-

pations that individuals not only differ widely in ability to turn out units of work, but that under scientific methods applied to business all are capable of improvement, and that the percentage of improvement increases as one advances up the scale. That is to say, the man who can turn out 10 units of work in a given time is capable of increasing his efficiency at a higher percentage rate than the man who under similar conditions can turn out 8 units of work. The inference drawn from this illustration is that in school work we should expect to find even greater variation under methods of learning which aim to develop each individual according to his capacity to improve and to advance. This is one of the essential reasons for the contrast which is being urged between a set-lesson assignment procedure and the indeterminate-assignment plan.

In support of this view it is further maintained that a quantitative outlook upon subject matter in terms of the current conceptions of minimal essential-content ideas falls short of a productive analysis of a sound educational procedure. Once it is recognized that any group of pupils under classroom conditions is composed of persons, not 'cases,' and that each person is a potential candidate for a position in his group higher or lower than any one position temporarily assigned to him, then it would appear that that classroom procedure is on the whole best which promises large flexibility and possibilities for personal initiative and maximal individual progress. The customary differentiation in school marks is intended to indicate differences of this sort. These marks are mainly qualitative, yet it is not impossible to show that they are a quantitative estimate of the pupil's achievement and progress.

29. *Summarizing Statement of Recitation System and Directed Study.* It is maintained, therefore, that the practice of reciting facts and principles may be redirected very materially without impairing scholarship. To be concrete, it is not deemed essential that recitations should be conducted five days a week in any subject. With the new procedure, fruitfully directed, comparatively little of the old practice of reciting lessons will be retained. The corrective to any practice that would seem to lead to indefinite and irresponsible procedure lies in the fact that the pupil is required to furnish

reliable evidence of ability to cope with the problem or question set for the class. He must convince the teacher that he can use essential information in a forward moving process of thinking. As much time as seems desirable may be devoted to fixing, temporarily, facts which are to be employed in the solution of a new problem. Directed study seeks to avoid making a fetish of mere repetition of another's conclusions. The delivering of parcels of knowledge as they were received is not thought to be profitable. The fault of cramming will continue just so long as the reproduction of ready-made knowledge is emphasized. The complaint that our pupils do not know anything will continue to be made just so long as a memorizing school is fostered. Too much valuable time is wasted in the testing of ignorance under the recitation system. It is alleged that "the capacity of the human mind to resist the introduction of knowledge can not be over estimated." Scholarship, in the sense of accredited information, is suffering lamentably.¹ The practical question turns upon a defense of our educational system on some other ground or in a substantial modification of classroom procedure. The latter alternative seems probable. It would seem, therefore, that a radical constructive departure, that in no conceivable manner can destroy anything good in the prevailing practice, is clearly defensible. The plan of directed study is easily administered, externally. The recitation period of whatever length can be utilized for the new procedure. In other words, no complicated reorganization is necessary. The redirection of classroom activities can be begun at once.

30. *The Indeterminate Assignment Idea.* A striking fact is

"Complete statistics which would tell us how many of all the pupils who study Latin, algebra, and geometry fail to master them do not exist. But we know that a large percentage of the better students of these subjects try the college entrance examinations, and that for these examinations many receive special drill in addition to regular teaching. Now in the examinations held by the College Entrance Board in 1915, 76.6% of the candidates failed to make even a mark of 60 in Cicero; 75% failed to make a mark of 60% in the first six books of Virgil, every line of which they had presumably re-read; 69.7% of those examined from quadratics on failed to make as much as 60%; 42.4% failed to make 60% in plane geometry. What would the record be if all who studied these subjects were thus examined by an impartial outside body?" Flexner, *The Modern School*, p. 6. See also an article by the same author in the *Atlantic Monthly*, April, 1917.

brought out in comparing the work and attitude of pupils under the old and the new procedure. In the formal assignment of so many exercises or pages for all alike no account is taken of individual differences. Either one of two extremes is likely to appear: an assignment far too difficult for the lowest third of the class or very much below the potential level of the upper third of the class. It would be difficult to determine which is the greater evil. Discouraged and confused pupils are a sad lot indeed, yet indifferent energizing by capable pupils can not be defended on any grounds. The nature of the assignment problem bears directly upon this situation.

Any set assignment is in reality indeterminate. Like amounts of effort or power do not follow as a result of a uniform assignment. If a given number of problems or exercises in mathematics is assigned for preparation, pupils destroy automatically all appearances of uniformity. A class group is made up of individuals. Some of them solve three or four exercises while others solve eight or ten. Results are variable. In history, English, science, etc., in which a limited number of pages may be made the basis of the assignment, it is exceedingly difficult to secure uniformity. All pupils of the class may read the required number of pages with only the slightest degree of correlation of results as revealed in testing for information, organization, ideas. Class instruction fails, as it should, to reduce all pupils of a given course to a uniform level.

In view of these facts of variability, the teacher who frankly sets out to develop a procedure based upon the indeterminate assignment idea recognizes at once the problem of individual instruction and the principles of individual differences. No effort is made to secure uniformity of results. The important issue is the development of the individual. The agencies of the classroom are made to contribute to this end. It does not follow that the common elements of instruction are to be set aside. On the contrary, the forces of social direction in teaching are constantly aligned to foster individual initiative and personal growth.

31. *Minimal Essential Content: Objections to the Movement.* The minimal essential content idea is linked up with the question of the selection of subject matter appropriate for instructional pur-

poses and is associated with the uniform-assignment system. A certain amount of material, it is held, shall be arranged for each course—an irreducible minimum which each pupil in the course shall master in order that credit may be earned. This minimum is expressed in terms of facts, information, knowledge—the conception being mainly that of the number of things included. Non-essential matter is eliminated. Frequently it is asserted that obsolete material should be discarded. Include only that which has practical significance, it is urged. This discussion has led to a serious attempt to organize courses of instruction with reference to certain concrete objectives, particularly those of a vocational nature. The movement has proved valuable in so far as a better type of organization of courses has been developed than prevailed under the influence of a barren recitation of isolated facts. The main point, however, has not been raised; it is—for whom shall a minimal essential content be provided? If it is intended to provide just enough material to meet the needs of the pupils of average ability, then it is obviously inadequate, not only for those above, but also for those below the average. In testing for a certain school achievement, if it can be measured, an array of results is found to conform to the normal curve of distribution, provided enough cases are taken and the unit of difference selected is such as to secure the general form of distribution. The assumption that pupils are distributed by nature according to some fixed standard is a strong temptation to classify them to fit the standard, prior to a trial in a given course of study or in a part of the course. The class group is composed of individuals; while it is essentially correct that an actuarial accounting would lead to the conclusion that out of a thousand pupils of a given grade or course, a definite prediction could be made as to the number of pupils who would fall in each tertile (or smaller division), yet when it comes to selecting the particular individual who will be found in a certain position at some subsequent time, it is clearly an impossibility. Each person of normal capacity is a potential candidate for a relative position within a given group other than the one occupied at a given time. The minimal essential content requirement does not seem valid even for a selected individual, mainly for the reason that in

the conception of education as direction for self-expression a static view of either subject matter or the pupil is wholly inadequate. The amount of subject matter can not be arbitrarily selected and limited if the principles of self-direction and personal initiative are to guide practice. This outlook is pertinent, not only in thinking of the needs of pupils, but also in considering the qualities of teachers, no two of whom should be required to handle identical material in teaching the same subject. It will doubtless be readily conceded that flexibility is desirable and probably argued that ample provision is made in the use of supplementary material. The problem of persuading the capable pupil that he should accomplish more than the minimal requirement is at once apparent. No satisfactory plan has been devised to meet this problem under the uniform-assignment practice with the emphasis upon the quantitative outlook upon subject matter.

32. *Gripping Subject Matter and Procedure under Organizing Principles.* The indeterminate assignment idea lies at the very center of directed study as interpreted in this report. The aim is to substitute organizing principles for set lesson assignments. "The business of secondary education is to raise all subjects which it touches to the plane of science by bringing all into the point of view of organizing principles," says E. E. Brown. The implication in this statement is that teaching shall be redirected in terms of the essential modes of thinking and ways of organizing subject matter. Facts, conclusions, information are just so much data to be used in a problem-solving situation, in an organizing movement, in a developing situation. In geometry, for example, all of the pupils need to use such mathematical concepts as congruency of figures, parallelism, triangle, similarity of figures, etc. The amount and kind of material arrayed under appropriate headings may be regarded as subordinate to an understanding of the meaning and use of these organizing principles. In the development of one or more of these principles some pupils are able to solve eight to ten exercises while others in the same class can solve only two or three exercises. By shifting the emphasis from the uniform or set lesson, in terms of so many exercises, pages, or definitions, to those principles which are in a real sense inclusive, and also a means of

organizing one's thinking, a genuine redirection of effort is effected. It is still true that the number of exercises mastered indicates fairly accurately the ability of the pupil. But attention is constantly directed toward the mastery of certain principles through mastery and organization of objective data, rather than the reciting of a conventional assignment. The important consideration is ability to think and use congruency of figures, parallelism, etc., in many different situations. At once a real challenge is offered. The work of the class period carried forward under fruitfully directed study is a constant stimulus to each pupil to turn out such results as will disclose to fellow pupils and teacher, ability to grip a principle or way of thinking and to use it on new data. Each pupil is determining for himself a minimal essential content which becomes increasingly a measure of his ability to comprehend the principles involved. The organizing principles constitute the common ground upon which class discussion is based. Some organizing movement is selected as a unifying core. It may be a certain kind of story with a general structure developed to give pupils a means of constructing their written work in English. Under this organizing procedure one pupil may write four or five good stories while another writes only one or two. The opportunity for profitable class discussion is improved by a diversity of attainment. It is not essential that all pupils shall have examined precisely the same data. The main point is to make sure that all pupils of the group shall have been working toward certain common objectives and shall have gained some adequate idea of the means by which these objectives are to be reached. Then, before profitable discussion can be had, the pupils should have done some real work on the principle or topic which is to be discussed. At these frequent times of vital discussion, when ideas are thrown into the crucible to become chastened, much emphasis should be given to generalizing knowledge,¹ making applications and developing cross connections.

In connecting up these principles with a study and organization of courses suitable for secondary education, one must conceive subject matter as material to be used in the working out of organizing principles, rather than as so much ready-made knowledge,

¹See C. H. Judd. *Psychology of High-School Subjects*, Chapter XVII.

highly organized, only to be memorized or accepted, absorbed and recited. Each main field of secondary education illustrates some fundamental way or method of viewing or thinking some aspect of life or the world. There is the mathematical way of looking at the world. Physics is a method of dealing with phenomena. History presents a means of interpreting social forces. Composition and literature make use of certain principles of structure and modes of thinking on the constructive side as well as in the development of appreciation. The languages (the vessels in which 'culture' reposes) are concerned, among other things, with developing an analytical attitude towards one's vernacular, and the emphasis should be in the power to use, rather than to learn them. Manual arts and the fine arts make use of constructive principles and seek to express ways of thinking in concrete objective form. It is particularly important that a course of instruction should be made a means of positive and substantial growth in that line for which it is adapted.

The conception that one stage and type of education should be designed essentially as preparation for a subsequent course or level of education no longer occupies the center of the field of attention as in former years. There still remains, however, the problem of sequential arrangement of courses in working out both the relations between one stage of education and another and also the connections within fairly well defined curriculum planning. Nevertheless, the essential claims for any course of instruction at any time must be found in its intrinsic values. The traditional "three R's" are not to be justified mainly in terms of preparatory values, but rather because of the fact that they are essentially and peculiarly the three fundamental social arts and constitute in themselves the elements of a sound and justifiable procedure. The point of emphasis is that no study can be defended merely on the ground that it affords a means of getting ready to do something, although it is perfectly clear that some studies are utilized more fully than others in a sequence of development. Even in this regard, however, it must be evident that the present tendency is toward content values in education. Coming back now to the underlying conception of subject matter as material to be utilized in organizing in-

telligence and in directing the effort of the learner and by shifting the emphasis to the perception of principles, ways, methods of thinking, constructing, appreciating whatever subject matter is employed, it would seem possible to redirect classroom activity in accordance with this outlook. In every class there are first of all pupils of unequal ability. If the thesis presented above is correct, these differences may be expected to be increased rather than diminished. There would seem to be valid reasons from the side of the subject matter of a course to allow, if not to cultivate, a disposition to cover a wide range of material, so long as it bears upon some principle of the course which is being developed, and further so long as the material selected is not over-technical—although in secondary education there is very little danger of confusion in this respect. In fact, almost any principle, any comprehensive organizing principle, of any subject can be handled from many angles. A class group composed of pupils (of varying abilities), college seniors (present for a part of the year or semester) and staff teacher, such as the Wisconsin High School illustrates, may all work together upon a given topic, and no one of the group needs to feel limited in the presentation of any relevant material. If the situation calls for the writing of a certain kind of story in English, each one, including college senior and staff teacher, have an opportunity to put into the situation the best thinking and apply the highest art he is able to command. In like manner, if it is a principle in physics, no one of the group is likely to possess a knowledge of the subject in hand of so superior character as to make any clear-cut contribution to the discussion of it a confusing matter to the weakest member of the class. Practically every subject in the secondary school curriculum is capable of being handled in many productive ways, capable of being seen at different levels. A number of persons, grouped as a class, may therefore engage in a study with the greatest profit to all. All learn to think certain principles; some go much farther than others. All may make use of certain ways or modes of thinking; each is permitted to go as far as he can in application, in clear thinking, etc. No upper limit is set for any one in the group. The poorest one in the class is allowed to share the interests and work of the best; and it should be recalled again

and again that the poorest one is never to be regarded as a permanently static person in his position in the group.

No final classification of pupils in one category or another is conceivable in a school which emphasizes self-activity and the power to use knowledge. The tendency to classify pupils under conventional labels is a habit of the pedagogue. The C pupil, constantly reminded of his status, soon comes to an unchallenged acceptance of his position. Rigid classification acts as a discourager to many pupils. It is extremely doubtful whether or not the effect upon the more fortunate ones is wholesome. A false sense of superiority is inevitable in any predetermined selection. By adopting the principles of self-activity and personal initiative and by directing action increasingly toward self-realization, it is highly probable that the number of pupils who will be able to achieve some distinction in a class will be materially increased. At all events, it will be discovered that a final classification is impossible.

The life of the class may be found in the variety of subject matter and experimentation. Those who do most in the course profit thereby and detract nothing from the work of the lowest third of the class; in fact, the work of the highest third, carried forward on a plane commensurate with their ability, contributes positively to the improvement of the poorest members of the class. It seems important and valid also to think of each main field of secondary education as presenting progressively more complex aspects into many of which pupils of the high school are able to enter with far greater success than we have usually supposed, and furthermore, that, in a working class group, any provision which aims to present and develop progressively higher levels of handling a subject, well within the capacity of a part of the class, should be welcomed. Such is the aim conceived in working out the indeterminate-assignment idea.

33. *Uniform Assignment and Indeterminate Assignment Contrasted.* A brief summarizing statement is added for the purpose of contrasting these two conceptions of the assignment. What is included below is intended to be mainly suggestive.

The Uniform Assignment Plan

The requirements of class instruction are held to be such as to determine the conditions of classroom procedure. Both subject matter and methods have been developed primarily to meet the needs of a class as a whole. The unit is the group of twenty to thirty pupils. The needs of the individuals composing the group are incidental to the common needs of the class. It is sought to provide adequately for each individual in terms of the interests of the whole group. Set lessons are given and justified on the theory of the prevailing common needs of pupils of a given grade or course. Uniformity is regarded as a necessity. The teacher goes over a limited lesson assignment with a view to preparation for hearing the lesson recited. The pupil is supposed to prepare set lessons in order subsequently to reproduce them or to recite upon them.

Upon the basis of a uniform assignment of so many pages of the text, so many problems, questions, or exercises, the typical procedure in conducting the recitation is to employ the question-answer method. Not in-

The Indeterminate Assignment Plan

It is not to be assumed that class instruction is to be abandoned in shifting the point of emphasis from the class group as a whole to individuals composing the group. The unit is the individual, not the group. The common needs of the group are conceived to be subordinate to the needs of the individual; or to state the situation in its relation to directed study as described above, the agencies of class teaching in respect to elements of a common social and economical sort are designed to assist each individual towards his attainable goals. Individual progress within a definite class organization takes precedence over a kind of composite view of progress of a class group. Preparation by mastery of a lesson is not the essential point for the teacher. Pupils are not required to repeat what they have learned from their books. The teacher is concerned with the problem of directing action. The preparation that is needed is much broader and deeper than that of a set lesson in terms of pages of a text. Under a common unifying or organizing principle a wide range of available data is utilized. What pupils and teacher find to do both in the class period and in outside preparation is by no means indefinite on account of being indeterminate.

There are definite principles which are developed as the common centers of procedure and discussion. The unit of teaching is some comprehensive organizing principle, by using which pupils are directed in purposeful exami-

frequently as many as fifty to one hundred questions are asked during a recitation period. The unit of teaching most widely employed is the question and answer unit. When confined to the narrow boundaries of a set lesson assignment, as generally happens, the rehearsal of a large number of facts with little perspective is inevitable. The test is mainly a test of ability to reproduce the printed page. The question-answer method utilized as the chief means of conducting the recitation day after day easily degenerates into a memorizing procedure. The most barren form is found in the catechetical question with its stereotyped answer. The tendency is often noted to frame the question in the phraseology of the text material, calling for the answer in like terms. The topic recitation is offered as a corrective to this minimizing of subject matter. Also the *thought question* is receiving considerable attention in this connection. Numerous devices might be described, the aim of which is to introduce flexibility and to provide adequate means by which to stimulate individual initiative. A class period of forty to forty-five minutes is ample time for recitation purposes—in fact a shorter period might be utilized so long as the main purpose is a reproduction of a uniform lesson assignment. Much that is emphasized in the recitation system should be regarded as having value; but the testing for comprehension, for facts, and definitions should be considered as a secondary essential. The extensive use of the question and answer unit of teaching tends to blur the primary

nation of data. Organization is carried forward under the stimulus of a problem-solving situation. No less attention is given to facts, information, and organized knowledge; but the point of emphasis is shifted from a recitation of them to the use to which these same facts and knowledges can be put in thinking one's way in a developing process. The significance of certain facts, inferences, and deductions in a line of forward thinking is brought home to the pupil. The general direction is mapped out; a problem, defined; a movement set forth; a fundamental structure, principle, or law, explained. The teaching problem at once becomes a well-defined objective. Available data must be provided, adequate in amount and kind to serve as a genuine challenge to the best working powers of each pupil. The teacher as director of action is engaged in conferring with pupils, giving suggestion, assisting in organizing procedure, acting as the consulting expert, etc. There is a time and place for the questioning process. Class discussion is a form of activity towards which the movement of a given topic or principle should tend. It is most productively handled after pupils have something to discuss. In a problem-solving procedure direction may be given merely by calling attention to some principle or fact which the pupil is to examine and to try to use in a given situation. Constant attention should be given to the application and generalizing of knowledge and principles. A rational emphasis upon content education should lead to many fruitful ways of using

considerations of essential secondary education.

Quite apart from the question of values in connection with the temporary absorption of the printed page and its reproduction is the attitude of pupils during the recitation period. In reality the question and answer method of examining the extent of a pupil's mastery of a lesson engages the attention of a single pupil in the class group, all devices to the contrary notwithstanding. The old tutorial system was developed under the theory of individual instruction. The pupil recited to the teacher a certain set task. This system has been grafted on the recitation system. To be sure, all pupils of the class are expected to profit by the question, no matter who may be called upon for the answer. As a formal daily procedure much valuable time is wasted by pupils reciting what they know perfectly well, by attempting to recite what is not understood, dealing merely with the symbols of meaning, and by listening passively to the more or less brilliant or stupid reiteration of the lesson facts. Copying, rather than constructing, predominates in the process of knowledge-getting in a system of education in which indiscriminate memorizing and passive appropriation of organized subject matter control

schoolroom knowledge in practical life situations. Pupils are quick to initiate work that connects definitely with life and circumstances outside their books, once they are encouraged and educated to go forward with their thinking.

The effect of developing a class period in which the dominant idea is that every pupil shall be at work is altogether wholesome. The longer class period of sixty to seventy-five minutes can be justified under the laboratory procedure. Reciting, simply as an end in itself, is reduced to a minimum. The pupil engaged in the passive art of listening and of "paying attention" is not found in the new school. The ability to recite somebody's else conclusions is clearly subordinate to a demonstrated ability to use these ready-made conclusions and all sorts of facts in some purposeful working out of a problem, topic, or experiment. The program of directed study enables each pupil to go forward at his own best rate. The interests of the class group are conserved by centering the work of all pupils about a few organizing principles and movements. Work intelligently entered upon in the class period is continued out of class. The teacher is concerned not only with the proper development of these organizing cores of a given course, but also with the progress of each pupil, one essential measure of his work being the amount of work done as well as the quality of it.

A conscientious and intelligent consideration of the question: 'What did each pupil gain from the class period?' would change profoundly the character of teaching. The same question applies to home study, with approximately the same emphasis. Pupils who habitually energize below their optimum are the innocent victims of a system which, it is felt, falls short of results commensurate with teaching possibilities. To have at least an hour of effective work in each course each day is, in itself, sufficient warrant for directed study, provided directed study secures this end. It requires only a superficial examination to detect the fact that many pupils get little out of the recitation period when conducted along the lines of rehearsing what is supposed to be learned in home study. The pupil who knows his lesson gains something but not much in reciting what he knows. Certain it is that he gains little in listening to a stupid reiteration of fragmentary matter. The all-too-common and exasperating performance of quarreling with pupils who fail to learn their lessons should be discontinued. In short, the practice of attaching primary importance to the verbal statement of the printed page through the reciting system affords a challenge, if it does at all, of doubtful value. The plan of initiating work under constructive guidance prepares the way for each pupil to go forward at his own rate within clearly conceived units of instruction. The essential points to be stressed cluster around productive ways of thinking the subject matter under consideration. The important thing is to make sure of evident progress toward real and attainable objectives. The place and value of what is usually called collateral and supplementary matter are readily appreciated. With primary emphasis on the direction of thought and activity the quantity of subject matter covered becomes a secondary essential.

34. *Evaluation of Results in Terms of Traits Germane to Education.* The good teacher has always given more or less explicit attention to those intellectual and moral traits which contribute to the development of efficient scholarship. Such traits as may be so regarded are merged in a composite rating of school achievement with the result that it is not easy to determine what traits are included or to convey with clearness to pupils and parents the value

to be attached to them. A definition of any trait in terms of school work is exceedingly difficult to frame. In the Wisconsin High School four traits, *application*, *initiative*, *attitude*, *progress*, are selected and each report issued to the pupil includes, in addition to a rating in scholarship, a rating for each study in each of these traits. The marks used are A, B, C—A representing a *high*, B a *medium*, C a *low* degree, quality, or amount of the trait. There is also a printed definition or description of each trait on the report card as follows:

APPLICATION relates to capacity displayed in getting work done. In estimating it, habits of work are taken into account. The disposition to do one's best consistently is encouraged. Application refers to one's relationship with one's work—an impersonal thing, a task to be done. It means *promptness* in taking hold of one's lesson, problem, or exercise, *dispatch* in handling familiar material used as means in the accomplishment of work, *energy* disclosed from day to day in the mastery of one's task. The *nature* of the results of one's efforts is taken into account in estimating *application*; a mere appearance of being busy does not mean a high degree of application. The aim is to develop working habits of the most effective kind.

INITIATIVE emphasizes ability to plan and to execute. It is akin to self-reliance. To think for one's self; to do for one's self; to use self-initiated energy; to work forward with increasing independence; to examine data and reach conclusions for one's self—these qualities are evidences of initiative. Self-expression lies at the center of this trait.

ATTITUDE refers to the manner of meeting responsibility as a member of the school community. Attitude refers to one's relationship with people—teachers and fellow pupils; it refers also to one's expression of one's own personality. One's attitude is one's manner of accepting and following guidance. It is the degree of spirit of cooperation which one has in dealing with fellow pupils and the school organization.

PROGRESS means that one's development is going forward. It is not always indicated in a mark of scholarship. An estimate of progress takes a larger view of growth than an estimate merely of scholarship. Usually a higher mark in one will mean a higher mark in the other. Conceivably, progress may far outrun or fall behind scholarship in a particular subject. Progress is the measure of one's personal growth.

Teachers find it by no means an easy task to rate pupils in these traits. The value of calling attention to them in this explicit manner is doubtless evident. A low mark is regarded by pupils

with wholesome concern. Not infrequently an explanation of a low mark in these traits is sought by parents. The experiment is believed to be significant and is being continued with enthusiasm. The traits selected for emphasis serve to call attention to the working habits of pupils. Pupil reactions are studied by teachers and an estimate of their relative merit is recorded. By the definition of these traits, which, by the way, is intended to convey the functional idea, it will be observed that a close connection is made with the general procedure of a directed study group. Two dominant ideas are emphasized; (1) trained individuality and (2) social responsibility. The best is sought for each pupil by making adequate provision for individual progress under conditions that require also cooperative thinking and doing.

35. *Points to be Clarified for the College Senior in Directing Attention to his Full Participation in the Course.* Supervised study at its lowest point of efficiency is ordinarily found under a rigid, mechanical sequence of preparation of lessons, followed by a recitation. A class period arbitrarily divided between so-called 'supervised study' and the recitation defeats the possibilities of a redirection of teaching. Supervised study, conceived as a substitute for out-of-class study, is too narrow and formal for the modern secondary school. Direction of activity which rises only to the level of controlling external conditions can not be received with enthusiasm. The teacher who supervises study by requiring all pupils in the group "to study their lessons," "to pay attention to the set task," "to think" without guidance, has failed to grip the meaning of the movement. At its worst this sort of supervision may be the mere exercise of police control—the teacher simply "keeping order" while the pupils are supposed to get their lessons. A shade higher grade of efficiency is disclosed in the case of those teachers who go about the room, from pupil to pupil, for the purpose of detecting what each one may be doing. When the teacher begins to check the work which pupils are turning out, either by sitting at the desk or by moving about from pupil to pupil, becoming thereby an active agent in the movement of subject matter, a decided improvement is inaugurated. The next step is to break down arbitrary separation between supervised study and

the recitation. In doing away with this separation *in practice*, purposeful recitation, as a phase of a larger unity in classroom activity, may be given its proper emphasis: Supervised study, or, better, directed study, reaches its highest point of efficiency under a vitalized class period in which every individual (teacher included) is working forward *in* and *through* subject matter which mightily interests each one. From the external side the teacher may be engaged in checking results by the conference method. In this respect there may be at times nothing cast up for the casual observer to distinguish the procedure from the ordinary classroom practice. The same individual conference method may be emphasized in class at other times to assist pupils in the organization of raw material. There are no sharp lines of cleavage between these activities. The results of more than one day's work may be submitted in these short conferences in class or in more extended ones out of class as often as circumstances require them. Here, the teacher as consulting expert, as well as the redirector of activity and the judge of pupil effort, must be comprehended.

Directed study, at its best, inevitably breaks away from formalism. In practice, there can not be mechanical separation between subject matter and method. The same principle runs through every phase of the educative process. It is only *in idea* that we can assert that it is the business of the pupil to think the subject matter under consideration, and the function of the teacher to think the mental processes which the pupil employs in his task. In point of fact, the pupil must have a *way* of thinking his subject matter. Organizing principles of appropriate and effective sort should be in the process of making in each course of study selected in secondary-school subjects. These organizing principles, as they are being mastered through use, become for the learner, keen-edged tools by which he cuts his way through new material. Brute facts are reduced to some order in a scheme of things which for the time being satisfies a demand of the mind for a certain system or arrangement. Pupils must be progressively acquiring ways of thinking the data set before them in their studies. There is no detached *way*, not even the scientific method, existing apart from objective material of one sort or another to be handled. The *ways* of think-

ing are developing in the process of meeting new situations. A way of thinking is not acquired and *then* used on subject matter. That would give prominence to a static view of both knowledge and method. The functional approach makes separation impossible and emphasizes the principles of growth in education.

If passive and purposeless memorizing of facts and conclusions imposed by some authority is ever to give way to the thought-provoking school, the academic view of subject matter must be materially modified. The lowest level of teaching is probably the catechetical method in which the more or less closed question-and-answer unit obtains. The various movements, or educational reforms, looking toward self-expression on the one hand and application in its wider educational sense on the other are focusing attention upon the need of redirecting subject matter in keeping with a functional view of the learning processes. Memorizing, for example, will not be arbitrarily set aside, but will be directed along active and purposeful lines. What is clearly needed in meeting effectively new situations will be mastered in the most economical manner possible. The idea of use in a forward-moving, problem-solving procedure is given prominence in the new view. This departure is not only radically opposed to memorizing for the sake of an alleged discipline but is specifically intended to promote self-directed activity based upon an appreciating need of mastery of fundamental truths and principles. The question which admits of a stereotyped answer has the advantage of definiteness. The task can be imposed and an easy test administered. The pupil either knows or does not know the precise answer. Reciting got its impetus from the practice of handling the question-answer unit. It required a teacher who could keep pupils under control while the ordeal was being carried out. The value of continuous questioning upon matters in which there can be no difference of judgment is not at all evident. Interest in the thought question is a decided reaction against the mere reciting of ready-made knowledge. The larger unit of teaching has steadily gained in favor. The topic arrangement of fairly comprehensive bodies of material serves to illustrate the movement away from the minimizing treatment of conventional subject material. The pupil is encouraged to organize and array data with

reference to some large view of the subject in hand. The problem idea carries the pupil still farther away from mere reliance upon the conclusions of others and requires more and more the self-active person and the subordination of information to purpose.

The apprehension that a definite task will not be exacted is operating to perpetuate a practice that harks back to the absorption of knowledge for its own sake, of facts simply as ends in themselves. There is no doubt whatever that pupils must be confronted by concrete situations in which specific choices involve specific consequences. The champions of arbitrary discipline often confuse the issue. Those who urge emphasis upon content education are not always clear in presenting values of a mediate and practical sort. There is a ritualistic program which is carried out in much of our secondary education. A kind of formalism is insisted upon. Practically all subjects have been reduced to a certain pattern of teaching which has developed out of the traditional school—a memorizing school which finds its justification in the assumptions of formal discipline. It is said that the Egyptian priests planted dead sticks and watered them with systematic regularity on the theory that it was a valuable discipline. Grain might have been planted instead and watered with the same regularity. The same discipline could have been secured. A real purpose, together with valuable outcomes in the production of useful things characterizes the latter procedure. Discipline becomes a secondary essential, not a justifiable end in itself. This contrast illustrates admirably the distinction between a formal type of education and content education. Either Latin or agriculture may be taught in the good old medieval way by sheer memorizing and reciting under the method of question-answer units of procedure. Either Latin or agriculture may be taught in a totally different manner. There is nothing inherent in any subject which requires an arbitrary or final method of handling it. The power to use the material of a course in the process of education applies to any subject. Much of the controversy in educational discussion over content and disciplinary values fails to place the emphasis where it ought to be placed; it is largely a question of teaching, after all. The old style of learning geometry, learning to recite not only the proposition verbatim, but for the

most part the complete proof as presented in the text is an excellent illustration of formalism in a memorizing school. The power to use or think the principles of geometry in facing new situations with incidental attention to accredited forms of statement and proof, or possibly working toward such form as is generally recognized, emphasizes a new point of view in teaching geometry. This conception is clearly presented in a comparison of the text books of three or four decades ago and the more recent productions, such, for example, as Wells and Hart, Betz and Webb, Palmer and Taylor, Slaughter and Lennis. The repetition of the symbols of meaning is no evidence, in itself, of ability to meet new situations. To begin with an elaborate system of formal definitions and highly organized subject matter in which conclusions are set forth in authoritative terms promotes undue absorption in memorizing and reproducing upon stated occasions certain fragments of ready-made knowledge. No objection can be raised against good form, even that which is fully accredited and urged by the academic man, provided it is an achievement towards which the learner is moving, gradually building into his experience through constant use of data, an intelligent appreciation of accredited form in the various courses pursued.

36. *The College Senior and Directed Study.* The purpose of the preceding discussion of directed study is, no doubt, obvious. The immediate bearing of classroom procedure upon the work of the college senior is readily apparent.

The conventional recitation requires, or at all events invites, a more or less formal pedagogical practice. A certain kind of preparation through the use of arbitrary lesson plans is quite possible. Teaching can be reduced to the manipulation of accredited devices. Methods are given a primary consideration. Knowing the subject is usually appraised in terms of ability to handle accurately the fact content of a set lesson. The impression gains currency that a method can be acquired and *then* used in handling certain types of subject matter. The recitation conducted in a formal manner presents certain recurring factors which come to be regarded as essential to the teaching process. Categories thought to have pedagogical virtues have been formulated, and with such

formulations extensive elaborations of the formal "do's" and "don't's" of conducting the recitation, making the assignment, etc., have been developed and promoted. A rigid compliance with certain formal declarations and specifications is frequently expected, if not exacted of teachers. All this seems to develop a mechanical outlook upon teaching. Emphasis is placed upon a formalism which becomes the criterion of estimating the efficiency of instruction. Under an established system, with subject matter definitely selected and with a stereotyped methodology inaugurated, the teacher is not expected to develop self-directive capacity, but rather to become familiar with the accredited plans in vogue and to fit himself into the system as he finds it. The *status quo* is perpetuated by the formal types of supervision of instruction.

It is an exceedingly difficult task to evaluate teaching at its true worth. One who goes into a classroom with preconceived notions is likely to see either what fits or does not fit into his scheme of things. Anybody can be wise after the event. Much aggravating comment is made by supervisors and inspectors on the basis of this philosophy. There are certain accepted practices, it would appear, and any deviation from them is regarded as dangerous. For example, there are those who assert with dogmatic assurance that the assignment should be made at the beginning of the recitation; others maintain just as vehemently that the proper time is at the close of the recitation. Again, the external critic is keen to ascertain whether every pupil in the class was called upon to recite and notes with some concern the fact that a certain bright pupil is called upon to answer several questions while another pupil was given but one chance. There is a long list of situations of this nature which might be mentioned. Such means of appraising teaching are not only external and arbitrary but also fail to encourage the teacher in the development of the more vital qualities of inventiveness, initiative, self-direction, and self-criticism. Much that is included in this approach might be appropriately referred to the apprentice idea of teacher training, the aim of which is the development of facilities whereby the would-be teacher is to gain an initial practice in doing essentially the type of work that will be exacted in subsequent teaching.

The point of emphasis in the Wisconsin High School in its teacher training function is shifted from a formal system of "practice teaching" to a plan of definite participation in the activities of the class room. The three elements which make up the class group are the pupils, the staff teacher, and the college senior. The directed-study procedure as interpreted and described above is meant to create a working laboratory for these three groups of persons, and to provide a set of conditions that will enable all members of this body, thus constituted, to engage in the work of the hour in a definite and responsible way. The college senior is not excused from any kind of responsibility which normally falls to pupils or staff teacher. The directed-study procedure presents a variety of opportunities for concrete participation and reduces to a minimum, the tendency to look upon the work of teacher and pupils as an observer. The manner of inducting the college senior into this group is a radical departure from the system of "practice teaching." He comes into the class on the pupil level and is required to enter into the work as a pupil, actually doing the work as one of a working group, thereby proving his ability to write a theme or story, to translate a passage, to solve problems, etc., and to meet these concrete situations as effectively as any pupil in the class. Gradually the college senior is expected to rise above the class level, and upon winning his spurs, he is given opportunities to share with the staff teacher those responsibilities which have been described as belonging peculiarly to the teacher in directed study. It should be clear, however, that the staff teacher enters vitally and actively at all times into the work of the class group.

37. *A Type of Comparison Between Practice Teaching and Directed Teaching.* The following instructions and discussion illustrate one of the means employed in developing the plan of *directed teaching*. (This bit of explanation is a part of a memorandum setting forth the three-fold nature of the Wisconsin High School, written by the principal of the school for the staff teachers. Such material is brought to the attention of college seniors. Only the item covering that function of the school bearing directly on the work of the college senior is included. The other two items

deal with the school in its first intention as a school, and the experimental function which is conceived in its purpose (see p. 13).

The primary function of the Wisconsin High School is its use as a laboratory for the college seniors preparing to teach. We have the difficult problem of maintaining a good school for both pupils and college seniors. We are engaged in a professional undertaking of very great importance. The conventional method of handling the would-be teacher is "practice teaching." That practice seems to us too limited for the new secondary teacher. It is not the thing most needed in the development of self-directing power. We are committed to a new principle and a new procedure. The conviction is growing, not on the grounds of expediency, but on strictly professional grounds, that we are engaged in the development of a plan scientifically sound and decidedly promising. There is a tendency now and again to fall into practice teaching. I am venturing to write out a statement contrasting two views which bear upon this problem. I solicit your criticism. These two views are the apprentice idea and the laboratory idea.

Apprentice Idea

With the apprentice idea one associates trade conceptions. There is a sort of mechanical performance dominant. The main thing is to acquire the motions which insure a certain manipulation. Ready-made devices (or methods in the superficial sense) are emphasized. Pedagogical training has become identified with the transmission of certain motions or ready-made devices: the novice is expected to learn them and to go through a course of training to make sure of a kind of routinized performance. Practice teaching as ordinarily carried out is based upon the apprentice idea. The candidate is imposed upon the class group. No principle of teaching is involved looking toward the welfare of the pupil group except in so far as the critic teacher is able to direct the efforts of the novice. The pupil group is conceived as material upon which the would-be teacher is to practice. Lesson plans are empha-

Laboratory Idea

The laboratory idea is suggestive, at least, of a scientific procedure. Some *principle, plan, structure, organizing movement*, is made the center of a developing or problem-solving situation. A teaching-learning core is emphasized. Facts, organized knowledge, information, are just so much data to be used in working out some *organizing principle*. In a general way the person who would be scientific "must determine what he is setting out to do. Next he must collect the materials which are available for his purpose. Then he must allow his materials to *redefine his purpose*, for when he gets them together he usually finds that they will not permit him to do just what he originally planned. They set a new problem much more concrete and definite than that with which he started." Any device finds its warrant in outcomes, not in the sanctions of authority. Accredited methods, like ready-made knowl-

sized. The assumption is that a certain section of organized (ready-made) subject matter is to be presented, mastered, recited. And the corollary is that some ready-made device can be appropriately manipulated in such processes. The way (or method) is determined quite as rigidly as the subject matter. The procedure in practice teaching is to have the novice take charge of the class (with more or less preliminary discussion and direction) and *subsequently* retire to have a conference with a critic teacher who is supposed to be able to tell what was effective, what should have been done, etc.

edge, must be constantly re-examined in terms of a *functional* definition of education. The college senior is initiated into the pupil group on the pupil level. The ability to enter into active, effective, participative relations must be proved. He is not to be imposed upon the class simply because he is a prospective teacher, but rather to work with pupils ready at any time to go forward, not according to preconceived and prearranged plans, but to go forward with such personal initiative and such self-directing capacity as can be developed by each one under the laboratory idea. Whatever comes after actual participation in the way of conference between demonstration teacher and student is incidental to the main fact in the procedure, viz., the performance of the student must be evaluated in the process of active participation. The student is not imposed upon the class. He must rise above the class level and win positions of leadership through demonstrated merit in handling situations, both as to subject matter and pupils. It must be a recognized leadership, not in accordance with formulas, but by participating with pupils and teacher in a manner that wins recognition.

These two conceptions involve irreconcilable differences in kind, both in underlying theory and in application.

This is a tentative draft, yet not to be regarded as merely "substance of doctrine." Our approach should be definitely developed from the laboratory side. It is comparatively easy to retire to the position of the critic teacher and to permit the college senior to go on in a mediocre way, and then to absolve full responsibility in a conference or a recorded judgment, setting out thereupon to repair the damage that may have come to the class.

Staff teacher, pupils, and college senior together constitute the three elements of a working class group. It is the function of the staff teacher

to enter vitally into all activities of the class period. No greater contribution, in the writer's judgment, can be made towards the improvement of secondary teaching than to impress upon our college seniors, the perception that *the right to stand in the position of the teacher is based upon a recognition of essential worth and sound professional qualities rather than upon the assumptions of legal authority.*

38. *Vitalizing Scholarship in Terms of Direction of Activity.* The preparation of a *set lesson*, one day in advance of the class, soon proves wholly inadequate, superficial, and mechanical. To get no further than this conception is evidence of stupid control of subject matter. The process is a deadening one. It means that the teacher has no real and sure-footed grasp of the meaning of positive, active scholarship. Such preparation is far afield in any genuine appreciation and mastery of a subject. The college senior in the course in directed teaching in the University of Wisconsin is made fully conscious of the need of a masterly control of subject matter. This end is accomplished through the indeterminate assignment plan and the organization of subject matter around principles of thinking appropriate to the course in hand. A ready command of the factual material used in directing the activities of pupils is essential if the college senior is to win the confidence of his co-workers. The ability to think accurately and to organize material to some purpose is constantly emphasized. The outlook upon the subject is both extensive and intensive. One must be fortified in the facts and principles and methods of work utilized in a given course of instruction. The adequate teacher must display a working familiarity and marked facility in arraying data, in handling the a b c elements of the course: at the board when demonstration work is presented in concrete form, he must be able to "talk and chalk it"; in the laboratories, manipulative skill must be displayed; in many situations running all through secondary-school subjects, the material of common sort used frequently—the multiplication tables, as it were, of the course—must be at tongue's end and finger's tip. It is no easy task to be able to meet the varied and unpredictable contingencies which arise in a flexible classroom procedure. The main point is clear if the notion of a 'set lesson' is abandoned and with it the narrow views of daily preparation and lesson planning which aim at a mere rehearsing of a uniform les-

son assignment. The class hour which calls for direction of activity as the primary function of the teacher requires in turn a usable knowledge of the subject one is trying to teach. There can be no successful performance in a hand-to-mouth preparation nor in a review of lecture notes from one's last instructor in the subject.

39. *The Nature of the Responsibility of the College Senior in the Wisconsin High School.* A somewhat elaborate account has been given of the classroom procedure employed in the Wisconsin High School in order to make clear the nature of the work of the college senior. As has been pointed out above, the kind of work done is best described as being fully participative. That is to say, the college senior is assimilated into a working group, there to enter into all sorts of activities—now from the level of pupil-response, now as assistant to the staff teacher.

It will be observed that one of the first requirements is a type of response that permits no uncertainty as to ability to handle subject matter. Bearing in mind that the indeterminate-assignment idea is given just as large emphasis as practicable, it follows that a limited preparation set by the boundaries of a certain number of pages or paragraphs of the text can never prove adequate to the situation.

The set lesson in a conventional recitation lends itself to a formal type of treatment. Details of method are given a place of undue importance. In fact, lesson planning may be carried to the point of fore-ordaining pupils to a certain kind of response, the assumption being that a given situation—a bit of subject matter—calls for a definite order of reaction. Such procedure is too frequently developed along lines of producing correct answers to fixed questions and a corresponding emphasis upon accredited methods of securing results of this character. In contrast with a formal scheme of preparation and recitation, directed study has been described as a plan of teaching by which all pupils of the class are actively engaging their powers in a forward-moving process. The teacher is mainly a director of action. The instructional function is regarded as subordinate to an effective direction of the learning processes of pupils.

40. *A Wholesome Co-operative Undertaking for the College*

Senior. The preceding discussion of directed study should be kept in mind in any consideration of the work of the college senior. In the classroom three groups of interest are interwoven. Staff teacher, pupils, and college senior are engaged in a procedure, the aim of which is to promote in mutually helpful ways the interests of all three representatives of the group. That the presence of the college senior reacts favorably upon the pupils of the school has come to be recognized quite generally. College seniors are reminded that it is the expectation that they shall contribute definitely to the development of classroom conditions that will leave no doubt in the mind of teacher or pupils as to the value of their work. The responsibility of the staff teacher is increased. It requires additional effort to provide opportunities for the college senior's participation, particularly in that part of it which brings him into teaching relations of the usual type. On the whole, however, the three elements which compose the class group are brought together to the advantage of all.

The first tangible requirement of the college senior is to enter into the work of the class by taking part as a pupil. This does not mean an absorption of subject matter for subsequent reproduction under a recitation system, although ability to handle subject matter is tested from time to time. The college senior is introduced on the pupil level. He is called upon just as pupils are. He is required to respond to any kind of situation arising in the conduct of the class period. If it is a question of brute fact, he is expected to handle it effectively. He is called upon to present a topic, develop a proposition, give a summary, organize a body of facts with reference to some purpose, write a story as the pupils do, enter into a discussion, take up the work at any point with a problem outlook or question, give suggestion as to procedure, volunteer in contributing to a recitation, bring in new material, go to the board or map to present some concrete illustration, translate a passage, manipulate apparatus—in short, to be ready at any moment to go forward with any kind of work as the best pupil in the class might do. With a class working forward under fruitfully directed study, the college senior must continue to demonstrate ability to rise above the class level in handling new material under the developing plan

of organizing principles. When a new principle is introduced and pupils are given data to organize or exercises to be worked out then and there, the college senior is required to enter into the work with pupils, writing the story, solving the problems, arraying the data, working out tentative conclusions or what not. Such direct forms of participating with pupils serve not only to acquaint the college senior with pupils at work, but also to create for him a new point of view of scholarship.

41. *Daily Preparation, its Scope and Urgency.* The type of preparation which a college senior needs to make in order to be able to meet the varied forms of activity required of him is by no means limited to a thorough mastery of a set lesson. There are all sorts of contingencies that may arise in handling a given subject. A teacher of mathematics is wanted, not a teacher of arithmetic, algebra, or geometry; a teacher of English, not a teacher of some specialized line of the subject; a teacher of science, and not merely a teacher of physics or chemistry, etc. Once the procedure is directed away from the set lesson and a recitation of it, to a scientific method and outlook upon the facts and data of a given course with attention focused upon perfectly definite organizing principles as a means of thinking the subject material available, then it should be clear that preparation for teaching can never be reduced to the mere informational level of handling a limited lesson assignment. We have the problem of application and of cross connections within a comprehensive subject group of related courses and the problem of generalizing knowledge whenever it is possible and appropriate to do so. It is essential, therefore, that an extensive outlook upon the subject one is teaching shall be gained, as well as specific and detailed knowledge and control of set lessons.

The college senior must be made fully alert to the need of this type of fundamental preparation. He comes into an appreciation of it in the first day of genuine participation in the work of the class. The new factor which is introduced in a course in its progressive development can not be isolated and discussed as some inclusive topic. Connections are to be made with principles and facts of the subject previously considered; experience is to be generalized. For example, the college senior may enter the class at the time

when the "Dred Scott Decision" is being studied. It is inconceivable that adequate preparation to handle the topic could be thought of in terms of an acquaintance with and a hasty review of a half-dozen pages of textbook matter dealing especially with the bare topic for the day. The college senior who is genuinely prepared to meet the situations that should arise in this connection, acting in the capacity of a pupil participating and a potential teacher, ready at any moment to go forward with a directing question or suggestion, must be conversant with the slavery issue in American history and able to handle with facility the salient facts and ideas of the movement of slavery. It might prove exceedingly embarrassing to the college senior not to be able to speak intelligently about the Ordinance of 1787, the Missouri Compromise, etc. Some of the best pupils will surely know these things and will be able to use them in the discussion.

The staff teacher makes no attempt to apprise the college senior of the probable data and principles to be considered in a subsequent lesson, apart from the general direction which is explicitly given to the class group as a whole. It is the proper function of the college senior to develop capacity for self-direction and self-judging in matters of this character. He is to find himself through the exercise of his own initiative and by participating in a procedure which is being organized as to its general direction but in indeterminate form as to details. In the selected comments in the following chapter some frank statements of the time and energy required by college seniors to meet their respective problems are set forth. Note that very often a set of exercises in mathematics or a foreign language leads to a searching review of the course for the purpose of being fully prepared to meet any possible point that might arise in class. Such work is definite and is regarded as essentially sound because it is mainly self-initiated and self-directed.

The aim is to develop a comprehensive outlook upon subject matter and to stimulate interest in using material with respect to organizing purposes. Ability to select and organize pertinent facts and ideas under some guiding principle emphasizes the need of usable scholarship and also the necessity of being able critically

to examine available data on the topic in hand. The danger of the college senior knowing too much is remote. On the contrary, it is soon discovered that scholarship is not a thing to be acquired in a kind of quantitative way and then drawn upon as a store house for teaching purposes. In the process of re-examining and in many cases of appreciating for the first time the subject matter of a given course, the college senior gains a clear perception of the need of recreating scholarship at the point of teaching as a vital and immediate necessity of personal growth.

42. *College Senior and Pupil Relations.* An important consideration in the plan of directed teaching is that teaching is infinitely more than a system of correcting the mistakes of pupils. Frequently the errors which pupils make should be regarded as evidences of progress. This attitude is not absurd nor inconceivable when genuine learning and growth are considered. To stop at the level of pointing out mistakes is positively harmful to intellectual development. It is only a negative kind of education in which factors outside of the classroom operate to stimulate thinking and to give challenge in whatever development is carried forward. When the function of the teacher is conceived to be that of directing action, many elements of a formal, instructional scheme fall readily into the column of the secondary essentials and play a minor rôle in conducting the work of the class. The general direction of effort is not lost sight of in a confusion of little things. A formalism which aims only at outward conformity is deemed to be a relatively unimportant matter. The college senior who gave fulsome adverse comment on a certain theme written by a pupil was herself reprimanded by one of the pupils in the innocent query: "Well, was there nothing good you could say about his theme?" And in another situation a college senior who was given a conference with a pupil for the purpose of going over his themes—a half dozen of them—got through in five minutes remarking to the pupil that she had noted in that brief time all the mistakes of English which in common practice calls for the reign (and the rain) of red ink. The pupil was dissatisfied stating to the staff teacher that he had expected to hear something concerning the quality of his writing, the ideas which he had expressed and perchance a com-

ment upon Palmer's "simple adornments" of writing, viz., the beginning, the middle, and the end of the story. By means of such circumstances the fact is driven home to the college senior that the adequate teacher in the new secondary school is not to be content with a mere correcting of mistakes.

43. *Opportunities for the Cultivation of Originative Capacity.* Nothing has been said thus far concerning the development of inventiveness, insight, individual judgment, and self-expression in all those relations in the classroom which invite reactions of varied sort. The ability to grasp some situation with originality is cultivated. The perception that flexibility should be given explicit emphasis and further that the teacher shall be regarded as director of action opens up many channels for the distribution of the unique abilities and developing powers of all members of the class group—pupils, staff teacher, college seniors. The opportunity is offered for each to give expression to personal judgment in handling situations, both with respect to the organization and use of subject matter and to the procedure in a socialized class period under stimulating direction.

44. *Performance of College Senior Appraised by Pupils and Staff Teacher, Directly.* The cultivation of frankness of intercourse and criticism should be noted. The college senior participates in a free give-and-take procedure. What he does is evaluated at once. Accuracy of statement, relevancy of suggestion, quality and effectiveness of the questioning process, soundness of judgment, expertness of manipulation, or whatever form of response is being developed—every phase of participation is appraised at its face value. Immediate criticism is never spared, although it may very often be given implicitly by staff teacher or some pupil in a manner that contributes to the effective working out of a given situation. An error in reporting on facts may be met by a mere supplementary remark correcting the error; a false inference, by a counter statement of relevant sort; an unproductive question, by substituting a more fruitful one; a poor summary, by calling on some pupil to do a better job of it; a faulty comment, by having some one else rise to the occasion, etc. When the college senior reads to the class a theme of his own, written as one of the pupils, opportunity

is afforded to rise above the class level, and to disclose the numerous pedagogical virtues which are deemed essential to the success of a teacher. In the presentation of a topic in history, science, or English, in the demonstration of a proposition in geometry, or in commenting before the class upon the character of any piece of work, the qualities of voice, manner, energy, interest, etc., and ability to organize and present material are patently exhibited. If the work is well done, executed with conspicuous success, commendation is not withheld. Judicious praise is used not only in securing the best from pupils, but also, applied with discrimination, in estimating the performances of the college senior; pupils enter very frankly into an appraisal of what he does.

An essential element in the plan of *directed* teaching lies in the development of active, forward thinking with a view to meeting unexpected situations. Attention is directed to a consideration of something comparable to the ever recurring new formations in a football game. Readiness to meet adequately new sets of conditions is emphasized. The ability to take the next step in any developing process, and to do it at any time effectively, is the test of many qualities, but a test in particular of alertness and sagacity in putting one's self mentally into new situations and thereby finding a way out in advance of another—the author, the speaker, pupil or teacher. To be sure, the concrete performance when one is called into action is the first objective to be considered. The habit of following a situation passively, as an observer is permitted to do, is discouraged, both on account of a certain type of irresponsibility cultivated and also for the reason that effective participation in an on-going problem-solving procedure is rendered practically impossible by such an attitude of mind.

45. *Promotion of College Senior on Basis of Proved Merit to Assistant to Staff Teacher.* After the college senior has demonstrated ability to cope with the best pupils of the group in handling subject matter, and has come to be recognized as one clearly able to rise above the class level, increasing attention is given to ways of assisting the staff teacher. The directed-study plan of teaching enables the school to provide such a participating relationship without having the regular staff teacher superseded. It will be recalled

that pupils work forward in the class period on new material for a major part of class time. Results are to be checked. Particular pupils are to be given direction. Groups of two or more in the class are to be given special assistance. Others are to be directed in the search of particular ends. In short, the directed-study plan of teaching, it will be noted, increases the number and kinds of responsibilities which fall to the teacher. The college senior is drawn into some one or another of these responsible relationships, participating for the time being as full assistant to the staff teacher. It should be noted in passing that one or two of the most competent pupils might be employed occasionally in a similar manner. There is something wholesome in the view that the yawning chasm between the traditional teacher-mind and pupil-mind may be bridged. At no time in the course is the college senior excused from responsibility for work as a pupil. These forms of participation suggested under directed study are in a real sense the outcomes of demonstrated ability to rise above the class level.

46. *Attitude of College Seniors—Responsible Members of the Class.* The point to be impressed at this time is the fact that the preparation and planning of the college seniors to meet the situations in class as described are in no sense formal nor indefinite. They come to the class with a keen interest and with intelligent preparation. They make their own plans and are taught to estimate the worth of them as they try them out either in actual application or in comparing them with those of the staff teacher. They are liable to be called upon at any time to lay out a piece of work for subsequent study. The fact that notice is not served stating *what* is to be done, *when* it is to be done, and *how* it is to be done, directs attention to self-discipline. "What shall we do next" is a question which stands out as a challenge to the college senior to be prepared, in so far as it is reasonable to expect, to take a step forward in the work of the class. If, for example, it is announced that the class will write (an examination) on the next day, it is understood that the college senior is to come to the class prepared to give the problems, topics, or questions or to write or to do both. Full responsibility is assumed for all the activities of the working group. At any time the college senior may be called upon to take

the leadership of the class—that is, to become, for the time being, the teacher. At such times opportunity is had to demonstrate not only ability to work in the group above the class level, but also ability to organize subject matter and to plan procedure.

47. *The Student's Daily Written Report.* Mention has been made (p. 21) of the fact that each college senior is to write a diary of his experience in this course. Each day a report of the previous day's participation is filed.

The daily written reports of the college senior are considered valuable mainly because the practice of giving a critical account of what one does from day to day is a means of refining judgment through the process of self-criticism. A tangible and permanent record of the participation and progress of each prospective teacher is produced. This record is an expression of individuality. The aim is to avoid a formal kind of response. No two sets of reports are similar in many essential points. It is impossible to produce them by imitation. Each college senior participates in some one of the various subjects and classes of the school, some entering given courses at the beginning of the semester, others at the middle of the semester. Even with the same class group the subject matter of the course for each half of the semester requires quite different sorts of preparation and response. Staff teachers are not required to conform to any fixed order of procedure. Class sections in the same subject under different teachers are not handled in the same manner. The conditions are such as to require each college senior to rely upon his own resources and to develop his own initiative and self-directing capacity.

These daily written reports furnish material for conference and critical comment. The staff teacher makes it a practice to read them as they are produced and to make such comment as the situation in his judgment seems to warrant. Criticism, both oral and written, is mainly constructive and is intended to assist the college senior in the development of power to estimate his own performance and to appraise in some valid way what he sees in the movement of subject matter and in the response of pupils.

The following chapter is an array of "selected comments" of typical sort taken from these daily reports. No corrections have

been made in the material selected. These excerpts will enable the reader to gain a fairly representative view of the nature of the written reports and the participation of college seniors. Much direct information is conveyed through these clippings concerning the classroom procedure in the Wisconsin High School.

48. *The Function of Directed Teaching in the Experience of the New Teacher.* It is left to the reader to form his own judgment concerning the validity and the value of the procedure described in this chapter and illustrated in the comments. A cursory survey of the diaries written by college seniors will no doubt disclose or suggest possibilities of a new and functional outlook upon teaching and education. The striking fact is lack of uniformity in these reports. Each prospective teacher "boils his chance in his own pot." There is a refreshing emphasis upon personal initiative and individuality. If the school is ever to become a willing and effective instrument in the development of independence of human personality, initiative, courage and power, together with a self-active, responsible person, it is urged that we begin with the teacher and recruit ability wherever it can be discovered. In America education is not designed to make 90 out of every 100 subservient to a ruling house and to the state. The school is not conceived with us as an institution by which to enslave the people; but rather the school is our universal agency by which the individual is to learn how to use his freedom and to act for himself. The spirit of America is something akin to the fullest self-expression of each individual consistent with the social and public good. Uniformity is not essential to the realization of the aims of a democracy. Identity of opinion is wanted only in holding a subject class under the control of an arbitrary state or static institutionalism. Teachers must not allow themselves to be enslaved by the majesty of plan and precision. The machine must not become the master. Mechanical efficiency is an elusive thing. The classification idea seems to run inevitably to a closed system. Some external sign or arbitrary standard operates to predetermine classification and thereby to encourage the preservation of a deadening *status quo*. The problem, in short, is to find a dynamic in teaching, to avoid taking secure shelter under institutional sanctions, and to grip the vitalizing elements

of a regenerating and redefining process of education in terms of life. Each new day brings with it a nest of new problems which must be frankly faced with courage, initiative, and honest doubt. The adequate teacher must suffer the pain (perhaps the joy) of tentative judgment, and be ready to meet new situations without limitation by a set formula.

The new teacher needs to find himself in terms of self-activity and orientation in the community of interests of boys and girls at work. Having grasped first hand the organizing principles of education as growth and having come up through participation with youth to a perception that the main preoccupation of high-school boys and girls is development, it is fair to assume that the prospective teacher will begin his teaching in the field equipped with a wholesome way of thinking about the energizing powers of boys and girls. He has been cured of the pernicious practice of 'school-mastering' *down* to the 'supposed level' of pupils. By means of this partnership, real and not pretended, the college senior has developed a vitalizing sense of the view that "Man creates himself by his own activity." The new teacher is expected to begin to understand his responsibility for the care of the youth of the nation. The selection of pupils with respect to the 'those-who' proposition leads to a kind of pedagogical predestination not unlike the old theology of determinism. A certain prevalent materialistic conception of classification of somebody else's children has in it the thoroughly modern practice of doing business on a cash basis, whereas the older theology did business on a deferred credit basis.

The procedure employed in the University of Wisconsin stresses the view that unexpected possibilities are to be realized in the lives of growing boys and girls, and it is the teacher's function to become the caretaker of the youth of the nation with something of the mission of service as well as scholarship. This thorough-going American idea that ours is an emerging of expert ability out of the entire people's striving, lies at the center of the procedure into which the college senior preparing to teach is inducted. The perception that ability to direct activity, or to stand in the teacher's position must be established by demonstrated merit within the activities of pupils is thought to be in full accord with the spirit of

America. The approach is shifted from the legal and authoritative sanctions of schoolmastering to the proposition that the right to stand before the class implies the duty and the responsibility of demonstrating to pupils the validity of that right in terms of a productive leadership which is recognized by those most concerned—the boys and girls, who at the same time are charged with a certain responsibility of carrying out the terms of a partnership between teacher and pupils. Or to put it in another way, pupils are to elect the teacher in the sense that they are encouraged to take an active interest in results and to share in those activities of schooling which are meant to develop self-active, responsible persons.

Obviously, the quantitative side of experience is a secondary matter. What is sought is a way of thinking, an attitude of mind, and then most of all a vital experience in participating in the activities of real education, supplemented by a critical, personal account of one's own activity in the procedure. It is not a question, therefore, of the number of times a prospective teacher appears before the class in the rôle of the institutional teacher, but rather a question of the quality of reaction that comes out of a varied participation in the on-going work of a class in which he holds an active membership. As will be noted in an examination of the selected comments in the following chapter, each college senior develops a unique opportunity for himself, and what he does grows up out of an inner demand of professional interest and not from any external manipulation of a set of algebraic formulas or mechanics of teaching.

49. *Every Item of Experience has Value.* This is the basic principle of democracy in education. The perception that each individual possesses absolute worth should find expression in terms of teaching the children and youth of the nation, not as a mere theory safely housed in the cloister; it should constitute the dynamic for the day's work of every teacher in America. To look to some external absolute—a system, a rule of procedure, a method, a rigid standard—readily reduces the art and science of teaching to a fixed, mechanical mode, the outcome of which is classification on the sanctions of a dead past, and the tendency is, on account of unthinking reliance on external controls, to find shelter in formulas,

methods and institutions which have served their function in a system of thought or society which no longer exists. To be able to *redefine* and to *redirect* any proposed method at the point of *active* experience in the immediate educative process opens the mind to a functional interpretation of teaching. If the individual counts and has absolute value, then the teacher, the pupil, counts and has value in the first intention. The autocratic principle, as such, has no warrant here. The thing is not good or bad, correct or incorrect, merely because it fits or does not fit into a predetermined or a pre-concluded system or method. Each item of experience counts and has unique value. The adequate teacher in a real democracy must be developing in this direction. It requires inventiveness and courage to sail into these uncharted seas of human experience. It requires an immediate capacity to evaluate experience while it is going on, if the conception of self-activity and the principle of growth in education are ever to find a real and vital application in teaching procedure.

No better illustrations can be cited than the "selected comments" in the following chapter to emphasize the significance of those experiences of the college senior which come to him directly as a part of his participation *with* boys and girls in a process of sharing activity of mind and body with them. It is the democratic contention, therefore, that some item of experience, possibly in itself a trivial matter as judged by the external critic with his standards of inexorable efficiency, comes to mean to the person having the experience a touchstone to his essential thinking about a large set of interests in a given field. The person who stubs his 'intellectual toe' on some brute fact and says to the pebble of experience, "*Art thou there?*" may take his point of departure from that item of experience and begin to reorganize his thinking and to refertilize his life with the thing against which he stubbed his 'intellectual toe.' A full acknowledgement of the value of the principle underlying this evaluating of items of experience at their true worth would carry us away from status in education to a view and a practice founded upon human values and interests in the making.

To illustrate this fundamental departure, let us turn to the first "selected comment" (p. 107). Here the situation is self-explained

The college senior in a brief statement has presented a departure for the profession of teaching. It will be well to note the fact that some seven years of study in the academic pursuit of Latin left something to be desired in assuring fitness to teach. Adequate academic pedagogical exhortation had been administered in the case of this college senior. Accredited scholarship and accredited methods had been attended to. The interesting fact is that academic preparation is in itself apparently no guarantee of fitness to teach anything. The college senior, it will be observed, entertained a naive notion about preparation. After some seven years of handling in an academic mode the simple fact of a vowel change in a verb from *e* to *i*, it remained for this college senior to meet a new situation in which this significant fact (insignificant to the external critic and, for that, in itself) served the purpose of organizing experience in terms of new values and new directions. The brute fact got itself hooked up to experience in a vital way; it was made to bite into experience, and in a real sense it became the means of effecting a new attitude of mind. The reader will no doubt find between the lines in this diary evidences of many unique experiences which were developing in this college senior. The manner of handling such situations is indicated in the principal's comment at the close. It was two days afterwards that the college senior read the principal's comment. It is left to the reader to conjecture what the intervening forty-eight hours meant to this college senior, as well as her subsequent participation. Suffice it to say that her record was very satisfactory.

To those who are working with college seniors in the University of Wisconsin in the course in *directed teaching*, each "selected comment" (or better each daily report made) has something of unique value for the professional preparation of the teacher.

CHAPTER II

SELECTED COMMENTS: A COLLECTION OF REPORTS FROM STUDENTS PREPARING TO TEACH

(Arrangement of the material in Chapter II.)

How the Comments Have been Selected and Arranged

A Specimen Selected Comment

The Comments

Conclusion

Readers will find the following guide useful in pointing the way to illustrations of certain important aspects of the student's reactions to the Wisconsin plan.

- (a) *Attitude of college seniors* entering high-school class on pupil level: Nos. 3, 5, 10, 13, 16, 20, 22, 37, 38, 47, 56, 75, 85, 86 and especially all by Student XIII (a genuinely 'human' document).
- (b) *Self-criticism of college seniors* while engaged in directed teaching: Nos. 1, 59, 69, 74, 76, 106.
- (c) *Self-direction of college seniors*: Student XXXII.
- (d) *Constructive comment* by staff teachers upon the work of college seniors: Nos. 1, 41, 42, 53, 82, 84, 100 and XXIX.
- (e) *Opinions of college seniors* of the value of participation in directed teaching: Nos. 1, 85, 100, 107, 108.
- (f) *Procedure in the Wisconsin High School*: Nos. 39 to 45, 87, 88, 97.
- (g) *Summaries by college seniors* after nine weeks of participation: Nos. 17, 19, 83, 85, 86, 87, 88, 89, 90, 106.
- (h) *Notable changes in attitude* of college seniors toward teaching: Nos. 92 and 99; Students XIII and XXIX.
- (i) *High-school subjects represented*:
 - 1. Agriculture: XI and XXXII.
 - 2. Botany: IX.
 - 3. Chemistry: XXXI.
 - 4. English: XII, XIII, XIV and XXVI.
 - 5. German: IV, V, XV, XXIV and XXX.
 - 6. History: II, III, VII, XVI, XVII, XIX and XXIX.
 - 7. Latin: I, XX and XXI.
 - 8. Mathematics: VI, VIII, X, XXIII and XXVII.

HOW THE COMMENTS HAVE BEEN SELECTED AND ARRANGED

The object of this chapter is to illustrate the actual operation of the course in "Directed Teaching" at the University of Wisconsin by quoting freely from a considerable number of the diaries (daily reports) of students in the course during the past three years.

Each college senior in this course, it will be remembered, participates in the high-school class of the Wisconsin High School approximately forty days for one hour a day. Each of these seniors writes each day three to four pages (300 to 500 words) on the 5 x 8 cards (already described) which are provided for these daily reports.

The comments that are presented have been selected from several thousand of these reports. This selection, needless to say, has been made with design. The writer has a theory to demonstrate, just as the man of science seeks to demonstrate a hypothesis. To make the sampling fair, some examples of failure to grasp the procedure have been included, yet on the whole, prominence has been given to examples that best illustrate the favorable operation of the Wisconsin plan.

The selections include a few comprehensive reports and also a comparatively large number of excerpts illustrating single topics: the former will give a connected view of the student's participation and progress; the latter will serve to bring out problems of varied and individual sort. Even in the more comprehensive selections there can be presented only a partial account of any one student's work in the course. Rarely is any one report quoted in full; for the most part perhaps not more than a twentieth of the total record for the nine weeks is presented.

Only enough editing has been done to make clear to the reader matters of procedure not readily disclosed in the comments themselves. Unless otherwise indicated, the material appears substantially as it was written by the students, and there has been no attempt to shield the student who has been careless in analysis or who has made statements that are evidently incorrect.

A good deal of material has been included that relates to matters of individual differences. This because it is felt that much

significance attaches to the progress made by the college senior in understanding high-school boys and girls *at work*. Whatever seems to contribute to the students' developing powers in self-direction and self-criticism is germane to this study. Students are encouraged to give expression to their convictions. The greatest freedom is cultivated in this regard. Some students have disagreed courageously with staff teachers; yet on account of tangible evidence of progress in gripping situations with increasing originality and insight, they have been encouraged in their procedure. A colorless conformity or a studied imitation merely for the purpose of agreement is neither productive nor desirable. However, it must be recognized that deliberate adaptation is to be expected. While a critical examination of experience is held to be an element of value in professional growth, the fact remains that students carry over into their teaching methods and habits acquired in school and college. It is often a question whether the prospective teacher is to be influenced by collegiate methods or by the methods employed in high-school teaching. The desirability of the latter is no doubt conceded. If it should appear that college seniors express themselves with a modicum of enthusiasm for the procedure of the staff teachers under whom they are working, there are valid reasons which may be cited to justify such an outcome. Nevertheless, the deliberate plan of the course is to cultivate originaive capacity and to foster individual ways of meeting new situations, rather than to reduce reactions to uniform standards and patterns. This principle is urged with a full knowledge of the probable result that many teachers will continue to teach, for the most part, as they have been taught.

It may be said that not more than two percent of the students enrolled in the course have made a conspicuous failure. The negative results are, therefore, not to be regarded as negligible, but rather should be considered as positive evidence of the success of the experiment. Furthermore, it is interesting to note the fact that the most brilliant reports are not invariably written by the highest fifth of the group of college seniors, ranked in terms of academic ratings. Not infrequently a student of medium rank does conspicuous work in this course. It is safe to say that the student of low

standing in scholarship, barely passing, finds it exceedingly difficult to get on in work of this sort. An objective study along this line would no doubt show a high degree of correlation between academic standings and performance in this course; yet it should not be assumed that only the high type of scholar is assured of success. Other qualities count and in the nature of the work must be developed or disclosed.

The comments themselves are numbered, 1, 2, 3, etc., consecutively. The students from whose records the comments are selected are designated in Roman notation, I, II, III, etc. The high-school pupil is designated by his given name; the college senior by the initial letter, followed by (C.S.), as: Miss or Mr. A. (C. S.); the staff teacher by the initial letter, followed by (S.T.), as: Miss or Mr. A., (S.T.).

The written criticism of the staff teacher or principal is designated usually by printing in italics or placing it in foot-note. It will be remembered that the students file their daily reports in a suitable cabinet and that the staff teachers and principal as far as possible not only read these cards but also write constructive comment directly on them. The students read these comments with great care.

A SPECIMEN SELECTED COMMENT

The following selected comment is illustrative of the plan of this chapter. Mr. W. (a college senior) was a member of a class of 22 pupils in chemistry. Two college seniors were there. It will be observed in reading over a part of his report for March 21, that the staff teacher called upon Mr. W., and that the call came rather unexpectedly. The excerpt below indicates a variety of experiences. The staff teacher wrote a very frank statement. The pupils in the class did not fail to appreciate the situation. Mr. W. was very wisely handled by the boy who made the remark at the close of this brief performance.

Mr. W. (College Senior)

Chemistry—11th Grade—22 pupils—2 college seniors—Mar. 21, 18.

Mr. D. (S. T.) gave me a rather unexpected surprise today. The class had been assigned a general review of the work and naturally I had no idea

that I would be called to take charge of the class. So when I was asked to review the class on halogens, I felt like a man at sea without a rudder. Though I had a fair personal knowledge of the subject, I had not given much thought to the subject from a teacher's viewpoint. I must acknowledge that I was mighty crude at quizzing the class and undoubtedly left a "bad taste in Mr. D. (S. T.)'s mouth."

The class was well grounded on the subject material. The attitude of the class was excellent, and I hope that I will be able to redeem myself of the poor showing made. I hope that the next time the names will not vanish as they did today, for I believe that I have them mastered now to stay.

(Staff teacher's comment: *Are you sure you had prepared your lesson as you should? They say that uneasiness before a class is due to lack of knowledge of the subject. Your own feelings and reactions ought to be big help to you in preparing the subject matter for another recitation. You did as well as could be expected.*)

Note: One of the pupils asked Mr. W. after the performance what he was "sweating about."

THE COMMENTS

The college senior will now be given a liberal opportunity to speak for himself. His reflections upon his own experience as a member of the high-school class-group in which he is a self-active, responsible person, now a pupil, now a leader of the class or a part of it, are recorded in his own words.

I

Miss F. (College Senior)

Latin—9th Grade—26 pupils—1 college senior—12-3-17.

1. This, my first day in the class, was far from being what I should have liked it to be. In fact, I should have been just a little discouraged had I not, upon later reflection, found in my failure what I think an important factor for successful teaching in Latin. We were drilling on the synopsis of verbs, and Miss S. (S. T.) asked me to go around and correct the mistakes of the other pupils. Of course, it being my first day, I had had no preparation, but I felt so confident that I knew thoroughly the passive conjugation of the verb "mitto" that I thought it unnecessary to open my book before attempting to correct. In my effort to clear up the mistakes of one pupil, I explained the formation of the present tense as being merely the present stem plus the personal ending with the exception of the first person where the "e" changes to "o." Since the stem ends in "e", I failed to explain that this vowel changes to "i". Thus, I changed some forms which he had written correctly. A few minutes later I thought of my mistake, but being occupied at the

moment, the point was raised in class before I had a chance to go back to that pupil and correct my mistake. The look of reproach which I received from the pupil made me feel very much depressed for the rest of the day. But one thing, at least, I learned from the experience is that the essentials, such as forms of verbs, require constant drill on the part of the teacher and also that she must never be so confident of her knowledge as to consider further review unnecessary. I hope that through my efforts and my work hereafter I may regain the confidence of that pupil, if I have lost it. The experience, however, was very unpleasant, and one which I can not forget very soon.

(Principal's Comment: This is a fine start. I am delighted with your frankness. The impressive thing in your diary today is the power of analysis you have displayed. You have hit upon essential elements of experience. What you have said leads me to believe that you will make a splendid record in this course.)

II

Miss P. (College Senior)

History—9th Grade—25 pupils—3 college seniors—10-19-17.

2. We wrote during most of the period. I did not do very well on the map work. Map-drawing has always been very hard for me. I think this was caused mainly because throughout my entire High-School work we never drew a map—we used prepared outlines. I think the method we use at the Wisconsin High School is much better. I have learned a great deal through it. I think Miss O. (S. T.)'s plan of giving the children a two-minute rest is very profitable. That little walk around the room did us all good.

I was greatly puzzled when Miss O. refused to answer questions. In fact I spent more of my time trying to figure out *why* she did it than I did writing. Now, I think it was to teach us to rely on our own judgment, and reason for ourselves. I did not notice a bit of the usual "nervousness" which prevails at a quiz in most places. Isabel seemed a bit disturbed about it, but she seemed to write well, after she started.

John's reaction to the assignment was most interesting. I think Miss O. said something to this effect, "Study about the Greeks, oh five or six pages, or as much as you want." John stood up and said, "Oh, that's so indefinite." Miss O. answered him with, "Well, John, isn't that fine, tho. No limit to the amount you can do if you want to."

I think this work on the Greeks should be very interesting and profitable, and I do not think it will be so difficult for the children to grasp—there is such a story element in it, and so many heroes.

11-14-17.

3. Each day, I marvel more and more at the things done in our class. Why, I never, in my most extreme dreams, imagined such an hour as this

morning. I don't think I could count up on three cards, all of the things which happened. Miss B. (C. S.) started the class; we each had a group to finish up the talk on the battle of Salamis. When my group had just about finished Miss O. (S. T.) came in. She took the group which had finished the chapter and read Davis; I kept the rest to finish the chapter and then start them on Davis. Alford had not been in class for 2 days and he told me the whole of the back work. Wasn't that fine? There must be a stimulus for such work and I think, truly, that it is Miss O. While I was doing this Miss O. had a group. This must have been fine, for Kathryn told me before 8 o'clock that she had read a great deal outside and had a lot to tell us. Again, that fine spirit of co-operation. Miss S. (C. S.) and Miss B. (C. S.) had groups; some were reading in Davis; some at the map—but every one working. Now, I know a truly pedantic teacher, such as the one I had in Ancient History would have been really scandalized at the noise. Did it bother Miss O. or any of the rest of us? Why, no. We realized that it was, as Mr. M. once said, the “hum of industry.” I think *this* is a real vital point of development. Often the big work of the day has been stifled by that awful “Less noise, children.”

It is wonderful to me to note the problems these children can solve. Of course there is a wide variation here, due to individual differences, but they can all try. Arthur is very slow, and often misses the entire point. I was interested this morning to have him say, “Miss P., I'm not quite sure of the location of Salamis.” We traced it out on the map in the book and on the wall map. He went to work, with a will on the problem of why Alcibides was called “The Just” and the rest of the reading. I worked pretty hard with Vivian and Marion. At first they couldn't “get one thing out of it.” I started them with a few questions but left them to work the rest out themselves. I notice that Vivian will take a lot of help and cease to think for herself, if one gives it to her.

I never wished I could stay the remaining 8 minutes so badly. When I left I noticed that the group which went ahead the fastest was working out the document of Erythrae, and doing it intelligently. After this, no one can tell me, as they have, that a teacher can't use source material to advantage—that it is too dry. Two-thirds of our work this week was pure source and we all enjoyed it and profited by it.

11-19-17.

4. Miss O. (S. T.) greeted us this morning with a short written exercise. She gave about twenty questions which could be answered in a word or so. We had paper, and wrote the answers as rapidly as we could. Then we passed the papers back, last one coming forward and gave the answers rapidly around the class and checked the papers. No time was wasted on mechanics; I have seen ten minutes wasted in this way; everything went with speed. Miss S.

(C. S.) had the only perfect paper in the entire class. My mistakes were inaccuracy in Athenian and Spartan terms, and showed me that it is important that a teacher know her subject matter. Taking our grades with the other pupils showed that we were on the same level. I wish I might have been one of the perfect ones—I shall try to be tomorrow. I liked, very much, the way Miss O. handled the situation. Now a good many of the grades were real low, and the children looked discouraged. Miss O. said, "Children, did I do this to find out how much you knew?" They said, "No—you did it to show us how much we didn't know." It even made me feel better about my paper.

Then we went on immediately. The group which was absolutely sure of the importance of 454 B. C. went to the front and discussed it together, while the others worked it out at their seats. Miss O. put the question "What was Thucydides' estimate of Pericles?" Now the answer to this question could be found in the source material on pages 142-3. They seemed to have missed that point, so Miss O. gave them a minute to get it. Then most of them came forward with very intelligent answers. Again I saw the almost inestimable value of source material when used by an effective teacher.

We began in groups then to talk on the 30 year peace; my group did real well. I had only to put one question, and to call on one and then the other to contribute.

Then came general work on the new chapter. Here again, fine use was made of the source material. We studied the pictures and illustrations given. Although they did not all know all of the lessons which we had hoped to cover, they were all ready to give what they had. I do think we were at the fork of the road all the time. I think this morning's rapid drill and problems will really wake the children and us up to better work. I would almost be willing to say we'll have one of our best lessons tomorrow. Miss O. promised us a five-minute test tomorrow. *I am going to make out a set of questions myself, just to see how they correspond with hers—a little checking on my judgment.*

11-20-17.

5. I can never quite understand why the hour from 8-9 is the shortest in the day. We started this morning with a little rapid written drill work, as we had yesterday. There was marked improvement in nearly every case. My own was not so great. It surprised me to find that Katherine and a few others, who are among the best, were not in the highest class. It may be that they do better critical work and more thorough organizing of big ideas, and details do not remain with them so well. I think their own improvement was a source of encouragement to them.

Then we had general class discussion. It was very lively. The question of citizenship in Athens was compared with citizenship in U. S. and the relative merits of each and the defects discussed. Miss B. (C. S.) and Miss S.

(C.S.) contributed real well. The question of naturalization was made very interesting to us, for Grant and Herman had had members of their own families naturalized and we had real first hand information. Then we discussed the evils of foreign immigration.

Miss O. asked me to tell them about the way in which the big political bosses control these foreigners. By this method we related Ancient History with contemporary history and therefore all of it to our own lives and times. I do not think history could be thought a dry subject, if it were always taught in this way. Franklin wasn't doing very well, so Miss O. asked Miss B. to give him individual help. In this way, he was not allowed to "put the hour out of its agony," as Mr. M. says, or to "mull over" material which he already knew. One thing about this class, which strikes me as being important, is that we never know exactly what is going to be done. There is no minimum or maximum amount which we can do. It rests with us as to how well we use the opportunity. I don't feel as though I did extra well this morning. I'm sorry for I do want to make the best possible use of the remaining time.

11-21-17.

6. We had another extra fine lesson this morning. First, we had a little word problem. It is such a fine thing, in my opinion for clinching facts and at the same time eliminating the drudgery of cramming for exams, as was done in class when I took Ancient History. The most interesting part of the lesson came later. Miss O. gave us each a duplicate of a real inscription on a stone slab at Athens of 16 B. C. Say, the way those children worked that out was a marvel to me. I finished first and then went around helping by suggestion only, such of the weaker group like Hazel and Marian. The group which finished first, Kathryn, Louise, Herman, Edward and a few others went over and started to work on the advance outline for Friday. As I have said before, no one need tell me that source material cannot be profitably used. Another idea came to me. A busy, active class, which has problems and situations before it will not be interested in the trivial things which usually take up so much of the ordinary classroom time. The idea used to be not what we can do, but what we can get out of. There, this morning, each one of us took the responsibility of getting as much done as possible. The group, at the board, working out the outline, did not think of playing away the time rolling chalk or looking around or out of the windows. Now, I know that my High School class could never have gone to the board and done that. Everyone would have taken it as his one grand chance to play. I also think the general system, and the personal grip of the teacher are responsible, in the main, for this class spirit and ability to get work done.

11-22-17.

7. They say that man's untried powers are his best powers, and I am beginning to believe it. Each day we work out problems with source material

which at first seemed impossible to me. Some of the keenest thinking I have yet seen was done today. John and Kathryn and Dorothy were on the job better than ever before. Albert, who is by no means one of the best pupils read the entire first half of the document without a mistake and he had worked it out *himself*. Again, I see, that pupils cannot be classified; that they are ever emerging. Rex is coming by leaps and bounds, and even Arthur who is very slow and without much of the enthusiasm which characterizes some of the others made the most intelligent answers he has made this week.

We had group work on the Drama. While Miss B. (C. S.) and Miss S. (C. S.) had groups, Isabel put a picture of the Athenian theatre on the board. After I got started with my group I forgot that there was anyone else in the room. I had the surprise of my life for Stanley came up; he started the story and asked two of the best questions asked. I tried a new scheme. Instead of asking the question myself, I had everyone listen and as soon as they thought of a *good* question, they raised their hands and one asked. I never had their interest better. Agatha was telling how the drama originated and Stanley asked "Why did they call it a goat song?" Wasn't that good? *He* was the only one who could give even a possible solution. He said "Pan was a shepherd and tended goats. He originated music and maybe it came from him." I told them I thought it had something to do with the Greek word drama, but we'd all try to look it up for tomorrow. I think Stanley's interest was due mainly to his interest in music, but if we can get him that way, why not? He asked two other good questions, too. Arthur was better than usual and Alonzo was not so good until we were well started. We went to the board and had him write for us, so we'd be sure to know how to spell the names of the dramatists.

11-23-17.

8. (Explanation of procedure by staff teacher.—The 5th century of the Golden Age of Athens was our problem; the development of the drama an interesting phase of it. We had talked of the work of Aeschylus and Sophocles and had told the stories of Agamemnon, Orestes, and Antigone. We compared the drama of today with the old Greek tragedies, noting the number of people on the stage, the use of the chorus, etc. A pupil suggested that everybody try to write a tragedy patterned after Aeschylus or Sophocles, on the basis of any mythological story. These were read in class next day and the best one voted on. This was produced in a very simple fashion by the class, under the direction of the author.)

I have come to a new conclusion about teaching. Teaching is not giving, it is producing—getting ideas and inspiration and enthusiasm from young, growing minds to forge ahead and to do your very best in order to rightly fulfill the trust you have received. To me teaching, now means something far more serious than it did when I started. Then, it was mainly to "get a job"—now the best means of giving and getting the best.

11-26-17.

9. In Mr. P.'s article in the English Teacher's Journal, he says one aim of the teaching of English is to enable a child to be a better citizen by aiding him in developing a power of expressing his own feelings. I could hardly help applying it to history this morning, for the way these children expressed their feelings and lived old truths was a marvel to me. It gave me such a feeling of being good for something, to be able to help them.

Until now, I have always felt that my University classes as a whole stifled rather than helped my initial ability. I have always felt as a member of a group, not as an individual in a class. I can truthfully say that I have developed more initiative in my teaching and have let my imagination have range of its own rather than parrot-like repeating of the ideas of others (Mr. W. in Sophomore Composition last year gave me an Ex on my ability to punctuate last year, for he said I *had* no imagination.) I am going to try to develop it, nevertheless, by directing these growing children. One quotation comes to me "Unless you become as one of these you cannot enter the kingdom of Heaven." Heaven, here, to me means a personality.

III

Miss H. (College Senior)

History—9th Grade—25 pupils—3 college seniors—11-22-17.

10. I have nothing more to say—when pupils are able to write a tragedy with the success that they did they are certainly capable of doing any task set before them. I have been surprised at several things they have been able to do—I am more convinced that the upper limit of pupils' capacity has never been reached. Willmarth's was short, yet full of action and the tragic element. Gilman, Dorothy and Ralph all did very well—I could find a few bad criticisms to make, but these were far outweighed by the good points. This is a splendid way to get the pupils intimately acquainted with the Greeks at this time. They study the myths, and must learn something about the times in order to portray the drama in the language of the early Greeks. It also awakens their interest in the dramas of the period. Ordinarily they would have passed over the name and poets hurriedly, but now they take a deep interest both in form, style, and subject matter. I have worked a long time on my tragedy, and yet I do not feel that mine is nearly as good as some of the pupils' dramas I heard read today. I was not able to make many constructive criticisms on the papers. To Gilman I suggested that he have more feeling in the tragic scene in order to bring the event out with greater force.

IV

Miss R. (College Senior)

German—10th Grade—15 pupils

11-8-17.

11. Today I was taken by surprise when I was called upon to take charge of the class with Mr. D. (Head of Department) in the room. I had a feeling somewhat akin to stage fright, because I knew that four grown-ups were listening to everything I said and did. The verb work was quite gratifying, but could have been much snappier. One great mistake I made was that of failing to use a single German word in directing the work. I know what to say and how to say it, but absolutely forgot all about it. I realized my fault when I was again in my seat, but I mean to correct it next time I appear before the class.....

11-13-17.

12. Yes, Mr. M. (Principal), I am getting more and more meaning out of the printed paragraph each day. Those sentences (printed paragraph on daily report) are becoming more and more illuminating. I mean, as Mr. D. (visiting) suggested on his card to me, to be more active the next time I go before the class to direct them, for I believe that that is a real way to liven up and stimulate thought and reaction.

All my family and friends hear about these days, is my work down at the University or Wisconsin High School. Nor are they bored by these tales. They are very interested in what we are doing and accomplishing. Once or twice I have come in contact with people who believed that we practiced on the poor pupils down here, but I think when I finished talking, that they found such was not the case.

Today I started to talk German in class,—for almost the first time. I answered a question. I mean to do this as much as possible, because I want practice in using classroom German and in speaking without halting and having to form my sentences, by thinking English and translating.....

V

Miss E. (College Senior)

German—11th Grade—15 pupils—3 college seniors

10-10-17.

13. My long anticipated first day in the high school is over. Of course I expected to be admitted on the same footing with the pupils; but that pleasant principle assumes a different significance when one is in competition with alert young minds. I had half expected to play the rôle of a dignified spectator the first time and I was so startled at being called upon to act as a link in the story-chain, that I became very much confused and quite disgraced myself.

The children were certainly well behaved, and when we seniors were unable to take up the thread of the story, they did it very naturally and spontaneously,—and there was no expression of the patronage which they might have well felt. I am very glad for this, and I hope to prove myself worthy of their esteem.

I was most delighted with the frank enjoyment and interest that prevailed. There was distinctly an “at home” feeling which grows only out of a broad spirit of co-operation. Catherine’s lively participation in the work must surely be an incentive to some of the others to get all the joy out of the work by putting themselves into it wholeheartedly.

The sixty-minute period was not in the least irksome to the pupils, for there was an opportunity to do some quiet, individual work after the general recitation. At this time, the pupils corrected mistakes in their themes. Catherine asked me about one of her mistakes; she had written in script and I was quite at a loss for a second, then I bade her read it and see how it sounded. So, on hearing the sentence, I was able to help. Needless to say I have been practicing the German script most all evening. I think I can master it in a day or so more.

VI

Miss A. (College Senior)

Geometry—10th Grade—30 pupils

11-20-17.

14. A great deal of the interest and benefit to be gotten out of geometry is lost when the class does not depart from the text-book. If I had not seen these new ideas worked out in class, I would have thought of teaching geometry much as it was taught to me—assignment in the text one day and reciting this assignment the following day. *Exercises unlike those found in the text in use, a chart which shows who is capable of doing the most exercises in a certain length of time, incomplete proofs, progress according to ability, and forming theorems with the figure for the proposition as an only suggestion** are all new ideas to me, and these ideas can be put into effect in any classroom.

VII

Miss S. (College Senior)

History—9th Grade—25 pupils—3 college seniors

11-14-17.

15. For the past three days the class has not been conducted in the same manner or the same *methods* of teaching have not been followed *twice*. How wonderful to have such power to avoid dropping *into formal modes* of procedure

*Underscored by staff teacher who remarks that this is a better summary of his own procedure than he himself had ever made. (The staff teacher in this instance is the principal of the school who teaches one class of high school pupils five days a week throughout the year.)

and direction in teaching. When the bell rang everyone was ready to work, stimulated by the ever impelling force of interest so characteristic of this class. Monday the pupils decided on the extent of their assignment at the beginning of the hour, but, yesterday, after an hour's hard work they decided how much they could accomplish for Wednesday.

Now as to the direction of the class recitation: Something new! Miss O. (S. T.) allowed those who were *sure* they knew their lessons to join her at the map where they talked about the development of the Hittite, Cretan, and Mycenaean-Cretan Civilization. Those who felt they were not sure of all names and principles of the lesson remained behind the lines to brush up before they appeared before the footlights for action. Miss H. (C. S.) and I proceeded to help these little people to discover their difficulties by individual assistance. What do you think I found to be the chief source of their trouble? Simply the "big names and so many names for the same thing" as Dorothy informed me had confused her. She couldn't understand why Mr. Westerman (author) should bother calling the Greeks the Hellenese when she was more familiar with the name Greeks. Sarah's chief trouble lay in the fact that she couldn't locate the places on the wall map because the cities, seas, etc. are mostly in Latin and she found it difficult to compare the names. As I remember my high school, that was my chief source of trouble before I studied Latin. Perhaps this map is necessary for use in Roman history, but I believe that these names and cities, etc. would mean more to the pupil if there was another wall map with the English names on it as the maps in the text.

When the pupils felt they knew their lessons somewhat better, Miss O. divided them into three quiz-sections with Miss O. (S. T.), Miss H. (C. S.) and myself as captains of each. With my group of three at one end of the room, we located all these difficult cities upon the map and proceeded with the story of our lesson. I was surprised at the number of thought-compelling questions that sprang into my head as we pushed ahead with the lesson. I believe that Miss O.'s device of thought-compelling questions is contagious! When we first began our group discussion, I found that Florence's mind was at the "movies" or somewhere else. But when she realized that Crete and Mycenaean Civilization meant more than words to her she became alive with interest. I soon found, too, that Sarah was not a "Slacker" at her work but that she thought she could "Bluff" on generalizations. However, by repeated stimulus and direction of thought, Jane, Florence, and Sarah realized that I wanted definite, specific knowledge without generalizations. What did I learn by this 15 minute practice or rather direction of thought? I learned that my questions must be *thought questions*, they must be invigorating and full of action, and that I must guard myself against *talking too much* and avoid *sweeping generalizations*. I find, too, that I must have my "big principles" and facts of the case at stake if I am to succeed in learning how to direct the thought of these pupils. It means constant, hard work and I mean to succeed!!

VIII

Miss D. (College Senior)

Mathematics—9th Grade—27 pupils—2 college seniors 3-7-17.

16. I do not believe my first day's experience was very successful. Perhaps I was a little nervous. I had difficulty when I got through with one thing and went on to another part of the subject. I didn't know what to say next that would be connected with what I had just explained. Therefore, I had to refer to my textbook quite a little. I understood everything, but it was difficult for me to make everyone else understand. I was careless about my writing on the blackboard. There are so many things to think about. You never know what kind of a question is going to be asked. The experienced teacher, of course, knows how to handle each situation. It is difficult to teach in a class which has been used to excellent teaching by an experienced teacher, for the inexperienced teacher thinks of that when she is teaching. I am very interested in the inductive method and think that it is the best method for beginners. Today they grasped the meaning of H. C. F. very quickly. I tried to do my best and appreciate the difficulty of teaching more now than I ever have. It is hard to make others understand your own explanation of a subject even if you do understand the subject perfectly.

IX

Miss P. (College Senior)

Botany—10th Grade—24 pupils—3 college seniors 11-28-17.

17. It is with a feeling of regret that I leave our Botany class today. The benefits which I have received from these past few weeks' work in this class have been numerous.

In the first place, I have learned practical Botany better than I ever knew it before. In the last Botany courses I have studied more microscopical work has been done and, as a result, I had become somewhat segregated from the practical part of the subject. It is these practical aspects which appeal to the high school pupils and make them interested to learn about their surroundings.

I have realized how well the teacher must direct the pupils' activities so as to teach them how to think forward and to act according to their thoughts. It seems to me that the teacher of to-day has more responsibility and a more difficult task to perform than one of a few years ago. For, formerly, the teacher was merely a person showing authority in the school or the classroom, and one who had a certain amount of stored-up knowledge of the subject and tried to put it across to the pupils as such. But to-day the teacher thinks primarily of the pupil and uses the subject matter simply as a way for influ-

encing the development of the child. At the same time the teacher is directing the child, he or she is a companion of the child's.

There must be no division between teacher and pupil such as having the teacher always before the class or seated on a chair on a platform in front of the class. A teacher must be one of the working group with the pupils—but still retain his or her dignity and control of the class. In order to accomplish this well, everybody in the class must be kept busy all the time, the teacher included.

I have noticed during these past weeks that the days that more discussion or recitation work was carried on than the examining or drawing of material, that there was a tendency for some of the pupils to loaf to a certain extent. Thus I have learned that each pupil must be kept at work, and that each child should be directed in such a way as to move forward at his or her own best rate of speed, in order to get improvement, development, or growth in each individual.

Never before have I felt so greatly, the need of the teacher directing the pupils instead of pushing them. Thus the teacher must be on the same plane with the class and looking at things on the same level and with the same views as they are. So a teacher must be prepared for new situations and demands just as much as he or she must create new ones. I am sure that that was the one great mistake I made when I had charge of the class—that I didn't apply and adjust myself to the new situations quickly enough.

In other education courses, I have studied that one must make school-work dynamic for pupils rather than static, and, I am sure that each day during this course in directed teaching, I have learned a little more about how to bring about such results. I know that I have learned to think better and more quickly, for one must in order to follow the different opinions of the class and at the same time to think ahead of the class so as to keep them interested. I have even had to think constantly outside of the classroom as well as in it, for each day new problems arose which were to be solved the next day. But the main thing which caused me to think was to decide for myself whether the new method of giving pupils more freedom and liberty was better than the mere recitation method used when I was in preparatory schools. However, I must say that I am absolutely in favor of the new way, because it leaves so much space for the teacher as well as the pupil to develop.

I think that our Botany class has grown as a group. When I became a member of it, there seemed to be some who were outside of the group; but a short time later, they all seemed to be working together in co-operation. However, each one is changing—at times certain ones will be somewhat lagging, then again will be up and doing. I liked the general attitude of the class in that each one contributed some idea nearly every day. The pupils would conduct their own discussions and arguments with Mr. F. (S.T.), or one of us three college seniors, or perhaps all of us, simply guiding their thoughts and deciding perplexing problems if necessary.

Another important thing I have learned in this course is how to conduct the activity of the class so as not to have the few brighter ones doing all the work and monopolizing the time. This was brought about by not having a definite, rigid amount that had to be covered during one class period; so that each pupil could progress as far as possible.

This course has also taught me how beneficial it is to make the class work something like a game. Although great caution must be taken to keep order when the pupils are given so much freedom. However, I think that if plenty of material and work are at hand that the "order" will take care of itself.

Besides giving me good ideas about teaching, this course has even brought about a change of thought within my mind as to just what a teacher is and what I should be when I get into my own schoolroom next year. To me, now, a teacher is a person who leads the children so that they will develop into good citizens, and benefit the public. Thus I want to be sympathetic, have initiative, and through careful direction or guiding lead all my pupils into the "group"—that is, that they will feel the need of co-operation in school and also in their future life and work.

X

Miss D. (College Senior)

Mathematics—10th grade—22 pupils—1 college senior—1-26-17.

18. The course in *directed teaching* is such that no prospective teacher ought to deny herself the privilege of taking it, for it gives her the opportunity to gain a better idea of the work for which she is fitting herself.

The class to which I was assigned was that of Plane Geometry taught by Mrs. V. (S. T.). I was required to participate in class exercises as one of the pupils, and to be able to conduct the class when called upon to do so, as well as to correct exercises and give assistance to pupils when needed.

By acting in the capacity of a pupil, I was able to get a keener insight into the difficulties of the pupils. As one of them I could talk with them and learn from them what they liked or disliked about the subject, whether the subject was difficult or easy and what the difficulties were, and whether they understood what was taught or not.

Opportunities to conduct class exercises were given. These were of great value to me for through them I learned that although it is absolutely necessary to know the subject well it is just as necessary that the teacher be able to present that material to the class in such a way that every pupil understands it. I also realized the utter futility of depending on a thoughtfully prepared lesson plan for I found that many unexpected questions arise in class. Then, too, benefits were derived by talking over the work with the demonstration teacher for mistakes were often pointed out to me which may have continued for some time were I teaching independently for the simple reason that their

significance *may* never have occurred to me. A student may know her subject well and may have educational principles well in mind but I do not think that she can anticipate all the different phases of a teaching lesson until she actually teaches.

Had I been allowed to do nothing in the class but observe, I feel that my time would have been well spent. Aside from the facts that all new problems were developed by the pupils under the direction of the teacher, that drill in application exercises was given the pupils only after a thorough teaching lesson and adequate class drill, that all the pupils were working all of the time, that home work consisted only of application exercises, and that the principles underlying the subject were continually being impressed upon the minds of the pupils, I noticed other factors which contributed to the success of that class period. The pupils were very enthusiastic about their work, but I think this enthusiasm was second to that of the teacher who, by her voice, her facial expression, mental and physical alertness, made the pupils feel that Geometry was a *real live* subject of importance. To be candid, I never realized before that a triangle could be so interesting and useful; the practical value of a triangle never entered my mind when I studied Geometry. The means employed to maintain interest and obtain results was another source of interest to me. Mrs. V. always seemed to do the unexpected thing—something which would firmly impress the point under discussion on the minds of the pupils. Besides having oral demonstrations of problems with figures on the board, and written exercises at the seats, Mrs. V. conducted what I would call a visualizing exercise. In this case the books would be closed, there would be no figure on the blackboard, but the figure would be visualized by the pupils, after agreeing on certain points, so that there was seldom any difficulty as to clearness. I consider such an exercise excellent training for the pupils.

XI

Mr. H. (College Senior)

Agriculture—9th Grade—12 pupils—3 college seniors—11-22-16.

19. Since this is my last day with the pupils I wish to sum up in a brief manner my opinion of the course entitled, *directed teaching*, and also the educational value of the course to me.

In the series of lectures given by Mr. M. at the outset some very good methods of procedure were presented. He emphasized the fact that when the pupils realize that they are doing things to obtain a definite end, that their interest will be aroused. I will admit that I was a little pessimistic about some of his statements. I did not think it was possible to regard a textbook of facts for recitation purposes as a minor issue, but I resolved to give as much of my time and assistance as was possible to obtain the desired end, since I realize that a pupil knows an object only after he has reacted upon it. I will

not repeat how results were brought about as my former reports explain methods used, but I wish to say that I am now optimistic about dynamic work and I know it is the *one* and *best* way of obtaining results.

What I got out of the Course.

(1.) I have learned that one must be alive, enthusiastic, and convincing in order to be a leader of pupils.

(2.) I have gained more confidence in myself than I formerly held.

(3.) I have learned the value of learning by doing, the value of specimens, charts, blackboard work.

(4.) I gained much valuable information by criticisms I received.

a. Keep smiling.

b. Use proper grammar.

c. Talk to your class.

d. Know what you're talking about.

e. Let the pupils do the work, you acting as their leader.

f. Don't expect to know everything.

g. Conduct your work in a convincing, enthusiastic manner. Have life or your pupils will be dead.

(5.) I realize the benefits of good questions.

a. Have your questions clear, concise and to the point.

b. Have thought questions and avoid suggestion work.

c. Put questions in the form of a challenge. If there is no chance for difference, questions are of little avail.

(6.) Don't overload the pupil but demand accuracy in the work done. Be their friend and companion. Help them along whenever possible. Treat them right, and they'll work for you.

(7.) My work has added greatly to my agricultural knowledge.

(8.) I have learned a great deal about subject matter; the amount the pupils will retain; the proper presentation; the transition from weeds to soils.

XII

Miss K. (College Senior)

English—9th Grade—34 pupils—3 college seniors—10-31-17.

20. The assignment for the day was a theme written in several pictures. Nearly everyone understood the assignment and we had some interesting stories. Rachel criticized Miss E. (C. S.)'s theme very harshly I thought but several other people justified it and I think the class as a whole thought it was good.

Dorothy asked to give a story which she had left from the day before. It was a very good story, and she brought a head which she had modeled

from plastacene, of the old Scottish chief in the story. Everyone was interested in it.

I thoroughly enjoyed being teacher. I couldn't quite realize that I wasn't playing teacher. It all came about so gradually that I wasn't very much frightened when I got there. Being in the class and getting used to it and then watching the pupils act as chairmen makes one accustomed to the idea of teaching. I think I made some foolish remarks in places where they weren't necessary, mainly because I wasn't quite sure of myself. It seems to me that in *directed teaching* pupils help teacher as well as teacher helping pupils. It is a mutual benefit idea, in which all gain more than in the old-fashioned way.

11-5-17.

21. The assignment for the day was a theme written in a series of pictures. The stories showed that the pupils are grasping the idea of writing a story this way. Franklin read a story that I thought was fairly good, though its plot was overdrawn, as we all agreed. However, Rachel advised him to throw it into the fire right away. I don't believe she intends to be unkind, but it seems to me she should be taught that she is unkind in her remarks. But on the whole, she is less destructive than she was at first. She is learning the ways of children, and coming down to earth, though slowly. I was indeed pleased to have her comment favorably on my theme. She found it even "humorous" in places. I should like to hear more comments on my stories. It is getting easier to write themes, as I write more and more of them. I find the idea of looking for pictures for suggestions very helpful,—as well as the pictures in the room. It is indeed a "favorable environment."

Our staff teacher showed us some truly wonderful books which high school people had made.* They were made to illustrate poems, and the pictures were both drawn and pasted in. They were works of art. Such a plan makes literature interesting to children and I should imagine they would enjoy putting the books together. He suggested that we make such books.

XIII.

Miss W. (College Senior)

English—9th Grade—28 pupils—3 college seniors—2-23-17.

22. I did not feel out of place on the pupil level. In fact there were several moments when I felt that I did not know nearly as much as a number

*This work was directed by a teacher who, the previous year, was a student in this course. The plan was developed as her own; possibly the suggestion came from another department in which this plan is used with considerable success.

of the freshmen in the class. This first class hour has proved to me that my position is not an easy one, and that I shall have to work hard in order to keep my self-respect. I feel that this one hour a day for the next ten weeks is going to be very instructive and helpful to me, and I am looking forward to the next meeting with no small degree of interest, and, it must be admitted, anxiety that my story be as good as the average.

(The staff teacher had explained the retrospective story. All were to write a retrospective in vision for the next day.)

2-27-17.

23. *Some of the stories were excellent and I was surprised beyond measure, that high school freshmen could write such themes.* Most of them had the form correct, and a good many proved to be endowed with the gift of imagination to a rather large degree. I was much pleased over the way my story was accepted. A number of pupils raised hands immediately and said it was a good story, well written. One boy remarked upon the vividness of the scene and how he liked certain definite parts of the story.

2-28-17.

24. It was a most eventful hour for me, for I was chosen chairman and had to conduct the class. Much to my astonishment I was as self-possessed as I ever have been in my life. I had no thought of fear, and I did not tremble in the least as I had thought I would..... I urged them to pay attention to the form, outline, English, and general effect. For a while the criticisms were very good. I made one serious mistake, by criticising before I had called upon the class for their impressions..... The other college seniors told me that the order was better than it had been since they entered the class, and they thought I had done very well for my first time. (Staff teacher absent for a week.)

3-2-17.

25. George, a pupil, read a very good story after which Miss B. (C. S.) made the rather severe criticism that she thought we ought to write the kind of a story we were asked to write, and that he had not done this. Almost immediately Sam, another pupil, rose and asked her if she could say nothing good about it. It goes to show that one needs to be very careful of what one says, for they are so very bright and quick to catch one up on the smallest things!

3-8-17.

26. The staff teacher told us a splendid story about the fairies, as an example of what he wanted us to do for tomorrow. I find that his illustrations

help me a great deal in understanding the structure of the kind of story we are asked to write, and the class enjoys them immensely.

3-9-17.

27. The work becomes more interesting for me every day. I am coming to know the pupils, and to take a personal interest in them....Miss B. (C. S.) was the chairman and I felt that she made a good one. She did not give the appearance of being a policeman, yet the order was good; and she knew just how much to talk.

Henry told his story very well indeed. He stood up straight, and gave the details of his story without hesitation. Edward could not do this but I believe he could learn to..... He can not even read his own themes well. Valdemar pleased me very much. He made a number of comments and stood up tall and looked as though he were interested. I have considerable faith in him after all. I believe that some one ought to be able to do worlds for him. I hope that when I teach I shall have just such a boy to deal with.*

3-13-17.

28. We had time for only three stories all of which were rather well told. George started out well, but stopped in the middle to make excuses.... He said he hadn't had time to complete any of them.... He is not satisfied with doing mediocre work. I felt that Edward had not told a truly retrospective story because he had the character dream the whole thing, and I thought that it had to actually happen. *The staff teacher had some one in the class point out my mistake.* I was not at all embarrassed to have a freshman know more about it than I knew. Miss G. was chairman today. I think she needs to talk a little louder however—her voice is rather low. I have difficulty in understanding her.

3-14-17.

29. Ruth, a pupil, was nominated chairman. I was asked to play the part of the staff teacher, not talking more than necessary, etc. It was great fun, and I enjoyed the period almost as much as the one when I was chairman. I was also requested to grade the different pupils as they told their stories. I could do this much better with practice. I asked the class to make less of destructive criticism and more of the constructive type of criticism. Sam was defending a part of his story today, when Valdemar said something to him. Sam lost his temper and told him not to talk until he was called upon. I made the mistake of letting this pass..... *The staff teacher put it up to the class—he asked what had been missed that a teacher ought not to miss. I am very thankful for these criticisms for they are helpful to me.*

*V. is a big, awkward, lazy boy, very careless and indifferent. He is not a bad boy but apparently impervious to learning.

I do not lose faith in myself, for I realize that I must learn to teach. I am far from knowing all about it at this stage of the game.

3-15-17.

30. One of the girls told a very interesting story, but it was not original, and she was severely criticised for not making up one of her own. I thought the class was correct in their criticism but a little bit harsh. So I made the comment that she had told it very well, as indeed she had, even if it were not her own.... It is remarkable to me how careful one has to be in a class of freshmen. They are so bright and intelligent that one cannot fool them and expect to have it pass unnoticed, and they are as frank as can be. No matter how much it may hurt they will speak out the truth.

3-16-17.

31. We were expected to be prepared to talk three or four minutes on any topic of current interest. This is really our last day of story telling for a while.... Harold, a pupil, was chairman today, and he did very well.... The little deaf girl told a very clever little fairy story about an old maid. She seems to have a splendid brain—the class is very quiet when she reads or tells her stories. I did not really know how kind and considerate youngsters could be. They are patient when Francis talks—he stutters so badly, but they do not make fun of him.... I was called upon, by the chairman, to tell my story. It was the first time I had ever attempted to do this sort of thing and at first I was a little bit nervous. But soon I became composed and had great fun telling my story.

3-26-17.

32. I was chairman and except for the fact that I talked a little too much I got along well. Even though we had two visitors, I was not at all disturbed. It is very easy to sit before a class now, and I feel that my first day of real teaching next fall will not be as difficult as it would have been had I not had this experience. The staff teacher made the criticism that I asked direct questions of people who already had their hands up to make comments of their own. I don't see what made me do this, for I knew all the time I was doing the wrong thing—that I ought to first give them the chance to say what they wanted to, and then ask them my question. But I am learning right along, and I do not expect to make no mistakes whatsoever. If I were perfect I would have no chance to grow as Browning tells us. The stories were of the new type—rather complex in outline—consisting of three pictures with a retrospective after each.... I interrupted at any point in the story and had some one point out by the diagram on the board just where we were—whether in the first, second, or third retrospective.... This was a clever device to keep every one on the alert—he has to listen every minute or else he won't be able to tell. Bernice was whispering to some one at the time so I asked

her to point out how far the story had progressed. She was apparently quite ashamed to admit that she did not know.

3-27-17.

33. A visitor paid me a compliment after class. She said that she didn't see how anyone could put herself on the pupil level the way I do. She couldn't understand why I should care whether the pupils cared for my story or not, for she felt that they did not know a good story. *I told her that she would soon change her mind if she belonged to the class for a while.* They perhaps do not know the fine points of writing, but they do know a good story from a bad story, and are not backward in expressing their opinions. Therefore it does make a huge difference to me whether or not they like my theme.

3-28-17.

34. Miss G. asked George to get up and tell us something about Indian life.... He was quite unprepared yet he delivered it as if he had prepared it. He and Sam have so much general knowledge—there is scarcely a subject mentioned which they do not know something about. *At times I am almost afraid of them, for I feel they know more than I do.....* Some days the class makes splendid comments and at other times they do not seem to get the big things, but they argue for a long while on some minor point. I do not think it advisable to let these arguments go on for any length of time, for they do no particular good, and they waste a good deal of valuable time.

To this the staff teacher added the comment, "Just like grown-up people;—or hardly any better."

3-29-17.

35. I have noticed that the class doesn't seem to care about "cutting up," and I suppose it is because they know they are not being watched. I can remember well what fun it used to be to get the teacher "mad" and how disappointed I was if she did not pay any attention to my actions. I cannot imagine the teacher leaving the room, as Mr. (S. T.) does now and then, and having things go on as well without her. The minute our teacher turned her back we were up to some mischief, and I see why it was so. Of course these children are no angels, yet for the most part, there is order in the classroom. Every day I realize more and more the value of the modern method of teaching.

4-3-17.

36. The fact that two boys had on new suits today made me realize how important it is that a teacher be careful about her dress, for if I notice what every pupil wears, how much more certain it is that they will know every detail of my attire! I resolved, way back in my high school days, when I used

to recite to a teacher who wore the same purple dress, month after month, with never a change, that when I became a teacher I would have some variety in my clothes.

XIV

Miss E.

English—9th Grade—32 pupils—3 college seniors—10-31-17.

37. I was called upon to read my paper today, and I was much discouraged with the criticism which Rachel (a pupil) had to make. The very part which I and all the class, as far as I could see, thought most essential and valuable in the explanation of the story, she criticized very severely, and also not in the most pleasing manner. I am truly grateful that she was the only one who thought that way, and that the other pupils all made encouraging comments and defended that part which Rachel criticized. Even though she criticized just the one part of it, I felt as if the whole story was worth practically nothing, so much did she discourage me about this one part. But, nevertheless, I am sure that I learned a valuable lesson from just such a criticism, and I hope that it will always remain with me and that I will always apply it. Hereafter when I am going to make a destructive criticism, I hope that I will never fail to mention at least one good point however little it may be, and I do not think that this should be hard to do for there is something good about everything if we would only look closely enough. I know that if Rachel had mentioned just one good quality about my paper, for I hope that there was something good about it, her criticism would not have discouraged me nearly as much. I have also come to see that when a criticism is made, the critic should be very careful about the way in which he states it. He should never let even the slightest trace of sarcasm creep into his remark, but should try to make it as pleasing as possible, and I am sure that the result will be much better.

11-5-17.

38. There is one thing that I want to say above all others about the criticisms made by the pupils—they are fair. Every day I have it impressed upon me more and more clearly how very fair every one of the pupils is. If one pupil gets up and criticises very severely the paper of another pupil, the latter never gets up and returns those criticisms when he has a chance, just simply for the sake of doing it. That is not their method, and every time I think of this I look up to them with more and more respect because of this fair and square dealing, which might easily be made otherwise.

Staff Teacher: You are now making searching, constructive comments about teaching—very penetrative indeed. I am beginning to be altogether sure that you will be an A-one teacher. Nothing could be more to the point than

your paragraph on this page. I had not quite thought out the matter myself until you made it clear to me.

11-12-17.

39. To-day we all came to class with our bibles,* so that we would be prepared to begin the bible study which Mr. P. (S. T.) had informed us that we would have. He had put up about two hundred and fifty pictures which represented various biblical stories. Each picture was numbered and had upon it a reference as to where it occurred in the bible. We looked at all the pictures to see if we knew the stories which they referred to. If there were some which we felt that we did not know or were not sure of, we took down those numbers and references, so that we might look them up. After I had looked over all the pictures, I found that I had quite a long list of numbers, but, in a great many cases, I knew something about the picture, but did not feel that I would be able to give the entire story which it was supposed to represent. After we had completed this part of the work, the hour was nearly up, but, for the few remaining minutes, most of us started right in looking up in our bibles those pictures which we didn't know.

This method I am sure is going to be an excellent one by which we can make ourselves acquainted with the bible.

11-13-17.

40. To-day we continued the work which we started Monday, that is we went on with our picture study, looking up those which we were not acquainted with. When I thought of this work in comparison with that which I was required to do in high school, I immediately concluded that if an hour were so spent in any of the classrooms there, it would have been regarded as ill-spent. Never did any of the teachers whom I studied under, allow us to do anything like this. They would have said that in the classroom we were expected to sit in our seats and be quiet; never would they think of letting us move about for a few minutes, to say nothing of three days as these pupils will have been allowed to do by the time they have completed this work. But I have come at once to see the value of the latter method—it means work and good hard work, even though one might not think so, and hence the accomplishment of something worth while. I know that I have worked every minute of the class hour both yesterday and to-day, but I feel that the knowledge that I have gained is worth all the work that I put in and, possibly, even more. But I must say that I have put much more than just the two class periods upon this study, for I have spent a great many more hours upon it outside of class. I am sure that I will be acquainted with the Bible, as I have never been before, by the time we are expected to have this work com-

*Bible is spelled with a capital—a mere convention, but you must use it.—
Staff Teacher.

pleted.

Mr. P.'s short talk to-day upon the teaching of the Bible in schools pointed out very clearly to the class what he was doing. He tried to show us that he was making us acquainted with the Bible without casting any reflection upon any creed whatever, and it is very evident that his plans are going to be most successful. After this training, no longer do I feel that the Bible can not be studied in high schools as well as other literature.

11-14-17.

41. To-day we continued the picture study which we started Monday, and which we are to be examined upon tomorrow.

I have often asked myself, if I had been asked to conduct my class while in high school, could I, or any of the other pupils, have been able to do so? And again I wondered whether we could have done so if we had been given the same kind of training as these pupils are getting? The conditions here are so different from the high school conditions with which I am acquainted, and the pupils seem to offer so many more possibilities than my fellow-pupils did, that I cannot keep myself from continually contrasting this method of education with the one which I studied under. These pupils are so anxious to talk and so enthusiastic about all their work, that I cannot see how my classes in high school could have been so calm and quiet, for I know that we were real live pupils too. I feel that this experience in the Wisconsin High School has been of very great value to me, for it has opened for me an entirely different view of teaching. I have come to see that my high school lagged behind because of the lack of force upon the part of the teachers. I feel quite safe in saying that a teacher makes the school. If she is a progressive and up-to-date teacher her classes will be such, and if she fails in this respect, the school will fail also. I have become so much interested in Mr. P.'s method of teaching that I am very anxious to get home at Christmas time so that I may visit my high school, and compare the work done there with the work done in the Wisconsin High School.

I am also going to take this opportunity again, of saying that I know that these few weeks have done much to develop me. When I first entered this class I felt very self-conscious, in fact, it might be said that I was almost afraid, but now I have come to feel that I have more confidence in myself, possibly I have not yet as much as I should have, but I feel that I can develop it and am doing so. I have gotten so that I like to be called upon, for the pupils have always seemed to enjoy what I have said, especially when I have given stories, and this has helped me greatly. As far as knowing the different things that come up in the class is concerned, I have often felt that the pupils knew much more than I, but now it seems to me that when some big question has come up that my knowledge has surpassed theirs as it should, but as far

as details are concerned, I think they would often times, and have in that case, surpassed me.*

11-15-17.

42. To-day we had a quiz upon the Bible pictures which we have been studying for the last three days. I did not have time to write about all the pictures which my group was asked to write upon, but I knew all those which I had time for.

This picture study has done much toward making me see, clearer than ever before, how important a part in every child's life individual difference plays. Now for instance, as for knowing these pictures, Lazare knew practically every one of them upon the very first day, while the rest of us knew many less, in fact some of the pupils knew but very few of them. This brings out that very important point, which I think every teacher should know, all pupils cannot and will not advance together, that is, their rate of advancement and of grasping knowledge will be different in every case. If a teacher is going to give every pupil a fair chance to develop, this is one, if not the most, essential point which she should know and understand. She must not expect that every pupil will progress at the same speed as every other pupil, for this will never be true; so she must conduct the class in such a way that all these differences will be met and provided for, otherwise some pupils will not advance at all. Individual differences *must* be understood.

I feel that the method used in the Wisconsin High School of having the university seniors go right into the class and do the very same work that the pupils are doing is a great improvement over the old method of mere observation and then teaching, for observation can never give a college senior what actual development with the pupils can give her. If I had been in the class merely observing and teaching without preparing the very same lessons as the pupils did, I would never have understood these pupils as I do to-day, for since I have been doing everything that they have been doing we have all developed together. I have come to see their good and excellent qualities, and also their weaker ones. I have been able to compare one pupil with the other, and also to compare all of them with myself in regard to the way I have been doing their work. *In other words I have seen development and have taken part in it; I have had real, true experience which is of greatest possible value to me.* I have also come to understand my own weaknesses and have learned how these same weaknesses have been met, as well as what has

**Splendid. You are thinking straight to the point. I like particularly your way of comparing the Wisconsin High School class-methods and pupils with those of your own high school without belittling the latter; of course, you were yourself there an earnest student; you would be in any school. And there would be many in any school. But the difficulty isn't with your kind of persons; it is with boys over-loaded with dynamic energy and girls over-loaded with emotion. What can the school do with them?—your school?—this school? Our attempt is to devise procedure which will help a good high school (or a good teacher) to become better by having a firmer grip, a more versatile approach, and a more productive stimulus toward all pupils.—Staff Teacher.*

encouraged me and what had discouraged me. I feel that I will now be able to apply just such things, as well as many more, in my own work to make it most successful. To sum this all up in the fewest possible words, I may say that I now understand boys and girls better than I have ever understood them before, and I have been led to see that if each pupil is going to have a fair chance in the classroom, the teacher must understand everyone of them as separate individuals and be able to meet their differences as they arise.

Miss E., you amaze me. For three weeks, or more, you sat in my class and were essentially an outsider. I don't think that you once got into the very heart of anything we were doing. I knew that you were not wasting time, but were coming along—slowly, very slowly. I feared, however, that you might not arrive anywhere within your all too short term with us. But now you truly amaze me and arouse me to admiration; you are now in some respects analyzing yourself and the pupils much better than I myself can. Splendid!—Staff Teacher.

11-16-17.

43. Here I feel that I must say something about the excellent work which Franklin did. He not only knew his story very well, but he actually stood up straight and talked as if he had something worth while to tell us. He had improved so much over the way in which he gave his last talk, that I could hardly believe him to be the same boy. I am very sorry that Miss P., the college senior who was conducting the class, did not give more time to the comments upon his work.¹ She gave only two pupils a chance to talk, but I am sure that Dorothy's constructive comment would prove most encouraging to him. I volunteered to talk at this time, but I was not called upon. The first time that I see Franklin I am going to make it a point to say something to him about his excellent work on Friday.² I think that when any pupil makes such a wonderful improvement as he did, the teacher, above all things else, should give the class plenty of time, even if it is a little more than she is in the habit of giving, to praise his work, for I know that encouragement will mean still better work. The last time that Franklin talked, I made the suggestion that his talk was good but that it would have been still better if he had only stood still and talked in a more determined manner.

Miss P., who was chairman, was criticized rather severely, while teaching, by Dorothy, a pupil, for talking too much. At that particular time she was trying to point out for the class the connection between two stories which had been given. It would have been a rather difficult question to put before the pupils, nevertheless, she really should have done so, and gotten what she could out of them before she said anything herself. I was sorry that the criticism was made while she was teaching, for I am sure that she found it much harder to continue her work than she would otherwise have found it.³

¹Yes, she missed a fine opportunity to be constructive. The comments would have encouraged him greatly.

²Hurrah! Staff Teacher.

³*Does she talk too much for an excellent teacher? Just right, throughout.*

11-19-17.

44. I had charge of the class to-day, and I enjoyed every minute of the hour. I felt very much at ease from the very beginning of the class period to the very end. At least I feel that I have actually acquired self-confidence.*

Miss R. (assistant staff teacher) asked me to work the pupils very fast for we wanted to cover just as many stories as we possibly could in the hour. In calling for the stories I gave the pupils many chances to volunteer, but I did not do this entirely, for there are several pupils in the class who hardly ever volunteer; so I made it a point to call upon just these pupils once or twice during the hour at least. To-day, since we were trying to cover as much ground as possible, if the pupils felt that they could not give the stories, or hesitated about giving them, I simply passed on to someone else, who could do what I wanted. I also made the discussions at the close of each talk as short and snappy as possible. One thing which I feel that I was successful about was—I did not talk too much. All the questions which were asked, I turned over to the class to be answered, and I am sure that I got very good answers. I feel that I got out of the pupils all that I possibly could. I tried not to let any discussions arise to-day which were not directly to the point, and here again I feel that I was quite successful, for practically every comment that was made was worth while in every respect and concerned itself directly with the story which had been told.

After to-day's experience as a teacher I feel that my knowledge really does surpass that of the pupils. I have felt this before, but again there were times when I almost doubted it, but now I feel that I really am their superior. I feel that to-day's experience has really put me on my feet, for I now believe that I have actually accomplished much as a teacher. The work of the entire period was not only very profitable for me, but, at the same time, I am much encouraged as to what I can really do.

11-20-17.

45. Mr. P. (S.T.) took charge of the class to-day. The first half of the period we spent upon a review of the Bible stories which we had already discussed. During the last half of the period Mr. P. pointed out to the class the differences between Religion, Theology, and Bible stories. His discussion concerning these words was very valuable to all of us, freshmen and college seniors alike. As a college senior, his talk was very helpful to me, for it showed how very carefully Biblical literature must be handled when it is taught in high schools. No teacher ever has the right to discuss religion or theology in her high school classes, but Bible stories may be taught, and after taking this course in the Wisconsin High School, I think that they really should be taught

*And you have. Staff Teacher.

in every high school at some time or other during the four years, preferably during the freshman or sophomore years.

I have gained very much help from the work which we have been doing during the last week. As far as knowing the Bible stories goes, I think that there is one thing which holds true with practically everybody. I am sure that we all know, or at least I did, various incidents connected with the various Bible characters, as for instance *Moses as a Baby*, *Daniel in the Lion's Den*, and other stories like these, but, at the same time, we all lacked an organization of these incidents; we haven't the slightest idea when nor how they came about, they simply are, to our minds, a collection of short stories which we can not associate one with the other. Now, after this short Bible study, I know that I have gained much more knowledge than I ever gained in Sunday School in all the years that I attended, for here I was given a systematic teaching or survey of the literature through which I could grasp the stories as they actually came and as they were related one to the other.

Mr. P's discussion concerning Religion, Theology, and Bible stories showed me again, very clearly, how much more a teacher has to do for some pupils in comparison with that which she has to do for others. There were a few pupils in the class to-day who were very well acquainted with much that Mr. P. said, while there were others who were not at all acquainted with most of what he said. This does not apply to the Bible only, but to everything that is studied in the schoolroom. Now the great task which every teacher must face is, to make known to those members of the class, who do not already know, all that she is saying, and, at the same time, be able to hold the interest and give something that is new and helpful to those who are already acquainted with the subject. I have also noticed during the last few weeks that the same work does not appeal to all the pupils for the same length of time. Some pupils become tired of what they are doing and desire a change much sooner than others do. These, of course, are merely different phases of individual differences, but they are very important questions which must be fairly and squarely met. In teaching, any question which comes up must be solved and solved correctly. Nothing can be left to slip by, for we are dealing with real boys and girls and through them human welfare. We must make it a point to draw out the best that is in them and to develop that best to its highest degree.*

XV

Miss S. (College Senior)

German—9th and 10th Grades—25 pupils—2 college seniors—2-26-17.

(Miss S. is a college senior of high grade. These "selected comments" are chosen from an excellent set of reports and represent approximately one-thirtieth of the written daily reports.)

*I am proud of you.—Staff Teacher.

46. (My second day). Today I spent the first part of the hour helping the pupils correct their composition books. I was careful not to *tell* them answers but to show them how they could find out for themselves. Donald asked me to translate a passage for him in his outside reading. By reading it out loud to him, and showing him the origin of the long words he worked out the meaning very well himself. Several pupils asked me why a certain construction was thus instead of so. This was good practice for me. The stories are somewhat like the house that Jack built. Would an exercise for drill in adjectives help in making the pupils remember cases, etc.? The pupils could make out lists of adjectives, or these could be written on the board—each pupil could take an adjective, and give a sentence containing it. (To this the staff teacher added, “A good idea. You must try to remember this and use it sometime when you are in charge of a class. This card marks an excellent beginning. It is *active*, not *passive*. You are getting your bearings.’”)

2-27-17.

47. My position in the class room is that of a pupil—at present—plus that of a prospective teacher. I take part in the class work, correct exercises, and answer questions asked by the pupils. Charles asked me if a certain word was transitive or intransitive. I answered him without thinking, but then afterwards I suggested that he look it up in the dictionary. (I was right but I realized that I should have told him to look it up rather than tell him). Most of the pupils ask questions which they can answer themselves—if they are given time, e. g. why do you use “*dieser*” when the genitive case should be used? And then they suddenly discover that the subject is plural. I also took part in the oral drill of the class. When the assignments are finished they do outside reading. To-day one boy finished a whole book—while some of the class are still laboring over assignments.

2-28-17.

48. I feel as if I had been promoted one step, as I now sit at the desk in the front of the room. Of course, I have the added duty of seeing how the work is conducted, and deciding different ways of doing things. I am not quite used to the German script. It is a little easier every day, though. I took part in the class work. The renarrating of a story formed the major part of the class work. The story was told very quickly and very well. The staff teacher said it was “*excellent*” work, and I noticed that several pupils turned around and beamed at each other at this.

3-19-17.

49. I took a walk up and down the aisles as usual today to see how every one was getting along. It is interesting to see how far each one is along, how they write, etc.....

Mr. D. (S.T.) took up the reading in a new manner to-day. The class never has time to get tired of his methods, and they have to keep wide awake or they can't keep up. He told every one to read a sentence, and to remember which one he read. He called people by name, and no one had a chance to go to sleep until his turn came. Then when every one had read a sentence, he went back, and every one (including college seniors) translated the sentence he had read. No one lost their place and the work went rapidly and smoothly. (Staff teacher's written comment here "*Your English? And you have a minor in it!*").....The class did excellent work. They are always interested because of the variety of instruction, and also—especially because they, themselves, have to take part in every movement or they lose out. (Staff teacher's written comment "*Besides, I try to keep the work just on the upper boundary of their ability; it is not easy for them, but they can do it!*")

It really is interesting to watch the differences in response the class gives to the staff teacher. It is an interesting problem. I am trying to solve it.....

3-15-17.

50. As a preparation for to-day I looked through the story for the day's work, *decided on several exercises which I thought would be good for the class*, and looked up prepositions which govern the genitive, dative or accusative cases.....

The staff teacher had prepared an exercise, and wanted me to write words and their meanings on the board. After the first class had worked on their composition books, he took up "*Alle Fünf*"—and in another different way. He read over what he had read the day before, and then went on to the new material. This he read over again pausing for all the words written on the board—in order that the class would work hard, and try to understand. During the whole time the pupils concentrated as hard as they could. Mr. D. told the class to study the words on the board thoroughly, so that they could know them. He said that every one had an *active* vocabulary; words that were in constant use, and a *passive* vocabulary; words that were understood.

(Comment by staff teacher: "*This is an excellent descriptive report, but I wish you had minimized the descriptive and elaborated on the analytical side a little more, especially with reference to the vocabulary written on the board. What were the strong and weak points of this scheme? Would it do for a steady diet? Why? These analytical features ought to be your goal more and more as you progress. Don't be afraid to criticize constructively. All I ask is that your criticism shows thought.*")

3-27-17.

51. As preparation for today I looked through the assigned lesson, and decided which exercises I should take up, if I had the opportunity, then I read several pages in "*Bunte Geschichten*," and reviewed word order in the grammar.

Each pupil read quite a long section of the story—standing in front of the class. When the class had finished Miss B. and I read the next chapter in the story. The next step was translation. Some people make certain classes of mistakes. Typical mistakes were made, "in" instead of "into," "da" = "Because" instead of "since" Mr. D. (S.T.) changes and combines and rearranges so many lesson plans that no one ever has the opportunity to sleep. The class certainly responds. He expects the best they can give, and they give it—with remarkable results. (Staff teacher's comment: "*The class must not get settled in a rut and know exactly what is coming next.*")

3-29-17.

52. In yesterday's report I forgot to mention how Mr. D. (S. T.) handled a situation which is very common in any class-room. The story the class was reading mentions the fact that the lamb said "Baa." Everyone laughed and from various parts of the room people began to say "Baa." Mr. D. laughed, and said, "That seems to please us. Let's all say 'Baa'." Of course the class laughed, realized how silly it was, and got to work again. Several times in other classes in my high school days I have seen a whole hour disturbed—merely because such a disturbance was not gotten rid of. Merely *commanding* order is not effective. (Mr. D's comment: "*I'm very glad you get this point so well. The trouble with so many people, teachers included, is that they lack a sense of humor.*")

3-30-17.

53. The first part of the hour I corrected a composition book. Most of the composition books show one or two mistakes made consistently throughout the work. I try to speak to the pupils with regard to these. Work that is correct on one page, and is incorrect on the next, etc.—spelling one word three or four different ways—is much more serious, as it shows either carelessness or thoughtlessness.

Mr. D. asked me to take the class—which I did very gladly. The first exercise I took up was one dealing with prepositions that govern the dative and accusative cases. The class had no trouble with these. Next I took up an exercise. After the exercise had been gone through once, Mr. D., the staff teacher, suggested that the class translate the sentences. Then they went through the exercises again, some one gave only the prepositions, some one translated the prepositions. Eva wrote them on the board from memory, and several people gave them from memory. Mr. D. suggested that the class

give more examples of the use of these prepositions. I did not realize how hard this would be for the class. At first I called on people,—but when I saw that this was difficult, I called for volunteers. This went very well—but Mr. D. suggested that if I had given English sentences for them to translate—it would have been an extra help.

I tried not to remain fixed in one spot on the floor, and I insisted on distinct pronunciation. I enjoyed the hour immensely. *For the first time it was not a strain to stand in front of the room, listen to the recitation, correct mistakes, keep the place and call on people.* Of course, I realize, I have just begun—but this is the first time I feel that I have made any progress.

(Staff teacher's comment: "*It is not the first time I have noticed progress. But I was especially pleased with your mastery of the situation on this day. You did some real teaching. Did you reflect on any ways in which it might have been just a little better?*")

XVI

Mr. K. (College Senior)

History—9th Grade—23 pupils—2 college seniors—11-29-16.

54. I find that it is necessary to change my passive and receptive attitude to which I am accustomed, and to get into the swing of the process which is new to me. After a few minutes in this classroom, I realized that there was something taking place which made the class period different from those of my high school days or even those of the University in most cases. I believe in this class there is something which towers above the mere giving of facts.

On entering the classroom, the first thing which struck me was the set of the whole situation. Everybody seemed anxious to recite and interested in the work. I couldn't help but compare this class with the ones I have visited in other high schools in the past years where pupils sat back and waited for the teacher to answer her own questions. I felt that everybody liked the course and was not there to gain a mark in the end, but interested in the day's work—minus the fear of making a mistake or flunking the course. One of the significant factors contributing to the success of the period was the method used to control or rather direct the energies of the pupils.

11-28-16.

55. Today I was hardly an intelligent listener, but I am still trying to figure out how all those proper names are retained by these people. I find it almost an impossible task. I can't lay the blame entirely to the fact that everything in the course is new to me and that it is very difficult to break into a class with the start of this one. Yet it seems that they have some power which in me is lacking.

(Staff teacher's written comment: "It will help you to cultivate this power, whatever it is. I expect you to find out what it is in a few days.")

11-29-17.

56. The atmosphere of this class room is becoming more familiar every day. The fact that I had the lesson well in hand seemed to contribute much to the success of my third period there. I could really get into the swing of the class for the first time.....I have been trying to figure out why one boy in the class continually whispers out answers to questions not directed at him. The first day I thought he wanted to be seen and heard—attention on self. I am changing my mind now. I believe that in the past he has been in the habit of acting on the impulse, and that this is what he is doing now.....The impression I gain more and more is that one must understand the pupil.

12-4-16.

57. Today we were making an outline of the chapter on "Fatal Lack of Unity." I was really surprised at the grasp these young people had on the chapter as a whole in showing on paper the exact relation of the facts; yet ask them and they could give the definite place of each fact.

The outlining of the chapter to-day showed to me two things above all: (1) The pupils have a logical train of thinking, (2) they can read in such a way that they can pick out the big points and subordinate those closely related.

(Staff teacher: "Your participation in class work was splendid. Begin to work ahead with me to find out of what each day's unit should consist.")

12-5-17.

58. In the review to-day I began to connect up some of the ideas I have gained.....In the answers to the questions asked of me I try to give answers which are easily understood, and which form connecting links with events coming before and after. Our problem, it seems to me, is to present history to these pupils in such a way that they realize it is one continuous story, not a lot of unrelated facts.....The nature of the questions has much to do with the success of the class period. For instance, concerning the march of the Ten Thousand, this question might be asked: "What were the results of the march?" The pupil would try to remember what the text said about it. Now let us examine this one: "Suppose you were a Greek soldier in the march. What would you have decided in regard to the situation?" Now the result will be that the boy will imagine himself a soldier, and try to draw his own conclusions, etc.

One of our problems in the school today is that of dealing with "backward" children.....I am watching Clara with interest. The first thing, I believe, is to have her develop confidence in herself—in her ability to reason

and think. I believe she has the ability, but is afraid to trust herself. She won't speak out, and I know that she has a fairly good answer in store at times when she gives none.

12-6-16.

59. Today I had my first experience in directing the class. We were drawing a graph of Spartan influence from 750 to 371 B. C. In directing the pupils I tried to ask questions demanding some logical thinking wherever possible. I find that the old method where the teacher does most of the talking is imbued in me. My frequent repetitions of things said lost time for the class. This is a big difficulty which I must contend with and overcome.

12-7-16.

60. I found it was a hard task to make out an hour's test for these pupils. I also learned that an examination must contain questions which require definite facts to answer them.....In this test I wrote it just as the rest of them. I tried to take the attitude of a typical pupil throughout the period. I want them to see that I am working with them and that I have an interest in the work. That alone does much to gain the confidence of the class. About the middle of the hour we dropped our work and walked briskly around the room.

12-12-16.

61. I was called upon to take charge of the class and open the discussion on the intellectual life of the Greeks in the fourth century. I tried to correct the fault of last time—that of repetition and loss of time. I tried to have the pupils develop the ideas which Aristotle contributed.

12-13-16.

62. Each one of us was asked to impersonate any one of the noted intellectual men of the fourth century B. C. Elizabeth opened the talk representing Praxiteles and told what she had done to make herself famous. Then we asked questions of Praxiteles to find out more. I told the class that I was Aristotle, the great scientist and a wise man. I was only sorry that I didn't live up to my reputation. Catherine asked me who my pupils were. I was ashamed of my answer. Here is another thing I think Miss O. (S. T.) is accomplishing—the pupil and the teacher are studying together. They realize that any one makes mistakes. If they had the other idea the gap between teacher and pupil would be materially widened. George said he was Philip, a great military genius and king. He said that he left a great and noble son to carry on his work. Carol asked him what seemed to me a remarkable question, one showing that her interest was leading her to think. It was this:

“What promise did your son show when he was a boy?” It required the joining together of a few facts and George did it in a very logical way.

12-14-16.

63. Today I was called upon to assign the lesson for tomorrow.....I tried to have my units contain certain definite events, and did not arbitrarily assign a certain number of paragraphs. In my questions, I found that some of them contained too much and that they were not of the right nature to guide the pupil in his study. This I must watch in my assignment for tomorrow if called upon.

12-15-16.

64. Four pupils were sent to the board to write paragraphs on certain topics. Alice wrote on the causes of Alexander's wars. I was asked to criticize her paragraph. This is one of my hardest tasks in the class. I know that I must think and be able to offer suggestions at once. I feel that I can do it with some time; but on the spur of the moment, I find it hard to give a thorough and adequate criticism of the paragraph. I cannot formulate my ideas fast enough—a fault which has followed me throughout my University life. I think this kind of work is going to allow this class to go into their second year without this defect.

12-18-16.

65. I was sent to the board to write down the changes which took place as a result of the Persian war. The class gave a list of things changed as (1) Buildings, (2) Trades, (3) Commerce, (4) Literature and Art, etc. Then using this as a basis I was to conduct a recitation. It was one of the biggest jobs I have tried for a long time.....It seems that when it is necessary for me to do the talking, I can't do it. I suppose experience will help me in this. I don't seem to succeed very well. Much of the material seemed to slip my mind when I was directing the class. I know that I must learn to handle the material and direct the efforts of the class at the same time.

(Staff teacher: “I suggest making an outline on a card of leading questions. Use it as you direct the discussion.”)

12-19-16.

66. Review for next lesson. In our study we try to analyze the chapter and pick out the big things which seem most important to us, make a complete list of battles fought by the Greeks during their supremacy giving date, parties engaged, place, far-reaching results.....With this skeleton we were able to trace with considerable accuracy the rise and fall of the Greeks with respect to other nations.....The task of finding all the battles for me will be a hard

one because I have not studied the first part, hard in the sense of time put in, but I think it will be an interesting and profitable study for me.

I directed the class for a short time on the Celtic invasion of the kingdom. I am trying to give questions which make the pupils think or else throw out hints to help them develop their topic. *I forgot the most important part of the story which seemed to get away from me until the staff teacher objected to passing (to the next topic).*

12-20-16.

67. I had the experience of correcting some of the maps which were completed in class on Monday. I found that Catherine and William had excellent ideas of the geographical side of our study of Alexander's invasions. Others as Catherine S. had good maps while some did not have very definite ideas of where Alexander went. I noticed one common mistake—the spelling of Issus with one ‘s.’

1-10-17.

68. I was called upon several times for explanations and answers. On the one for the cause of the Federal Reserve Bank Act, I found it hard to select terms that would make it clear. . . . I found myself taking up too much time throwing out limits and talking. After class I knew that criticism was coming from the staff teacher, and it certainly was a just one. I am conscious of it, but I find it hard to draw away from the habit.

1-11-17.

69. In my part in the class discussion I feel that I am right at home, but after I finish an attempt to conduct or guide the discussion, I am entirely dissatisfied with my work. I find it very hard to listen to the discussion, think of the material, frame or find a question if necessary and to keep the discussion moving without doing most of the talking. It seems to me that when I eliminate *one* fault another comes up. For instance, this lack of ability to keep things in order came out today when I called Richard by Stanley's name. It is not a grave error, I know, but I feel that there is not the proper coordination between all these things so that I can put all my energy into the work.

1-12-17.

70. The first thing we did on Friday was to discuss the method to be used in the review work. Horace, a pupil, suggested that we make an outline of the entire history of the Egyptians. George, another pupil, thought we should divide the content up into its important parts and with these supports fill in some facts to give us a skeleton of the Egyptian history, etc.*

*Other pupils made suggestions fully as adequate as these two.

1-17-17.

71. The next part of our lesson was very important. We started to work on our lesson for tomorrow. This idea of supervising the study of pupils is a good one, for much of their energy is spent without getting any return for it. I know a young man next door to me (in college) who is always sitting at his desk, yet he accomplishes very little. He does not know how to go about his work, and I think that is just as important as learning facts. Here in the high school pupils should gain power of concentration and intelligent reading guided by the instructor.

1-19-17.

72. In the class discussion many good questions were asked and answered. This one I select as typical of the review questions. "Show how the spirit of democracy grew in Athens." Now the answer to this question is not to be found in one paragraph on one page; but the pupil in answering must organize many details of the government which he has in mind from the various chapters. Such a question gives them the correct idea—viz.; that there was a development in the formation of this pure democracy, and later of the representative democracy. The idea of continuity was never given to me. I just imagined that something happened on a certain day of a certain year.

1-22-17.

73. Certainly no time is lost in getting started in this class. To-day the work was in full swing when I got there—before the bell had rung. Work was kept going on at top speed during the whole hour. When I entered a spell down was in progress and I took my place in the line. Snappy questions are asked of each one. The aim is to find out whether the pupils have the facts of any given period well in hand.

1-25-17.

74. After directing the class yesterday, I felt for some reason or other that I had done better than before. It seemed to me that I was able to think ahead for once. The facts did not require my whole attention. I feel convinced of the necessity of experience to correct such defects (as I exhibited at first). It is hard for me to have pupils do the talking. My tendency is to say too much. I caught myself in long questions, and after I got to my seat I felt sore at myself for using ten words which I could just as well have said in five. When I noticed my questions getting long it seemed as if I lowered my voice—just like an alarm nearly run down.

(Then follows an excellent summary of the course.)

XVII

Miss D. (College Senior)

History—9th Grade—23 pupils—2 college seniors—5-3-17.

75. I lost my opportunity with James this morning, when he asked me about a book with which I was unfamiliar. I had to stop and look it over at that time. I see now, more than ever, the value of being prepared.

5-4-17.

76. I was disappointed in this morning's hour—probably more disappointed in myself than in my work. I think the pupils responded quite well to the work, so I have only myself to blame for the lack of success I had in that *five minutes* or so of the whole period—a short time,—but there is so much to lose even in five minutes. (Staff teacher had called upon me to direct the work). Frankly, I was at a loss to know whether I should let them *give me everything*—or give them a list of the results of my work. As usual you helped me out with your suggestions, (referring to staff teacher), in asking for comparison of some barbarian and Spartan warfare—also the questions concerning my results. I know this is one of my big problems: it is going to be hard for me not to *give* the pupils what I wish them to get. I know it is important to have them bring out unconsciously what you wish them to get out of the work and *this* is just the hardest part for me to do. It is so much easier just to give them the material. In spite of the results, I am glad I had the opportunity this morning. Those few minutes have shown me a great many things. Of course, I was nervous just at first—and this added to my confusion. I was surprised at one thing that happened:—those pupils who responded best to me were exactly those whose attitude toward me I had questioned. I believe I made a special effort to draw out these pupils.

XVIII

Miss L. (College Senior)

History—9th Grade—24 pupils—4 college seniors—3-6-16.

77. I was called on to take up the discussion of the new assignment with the class. Miss O. (S. T.) greatly surprised me, but after a second's thought I called on Eleanor to name the new Romans and men of interest whose acquaintance we made in to-day's lesson. When she finished I quickly reminded her that my question called for new acquaintances. I here remembered my mistake in naming Eleanor before proposing the question so I called on Elsie and repeated it as I should have done first. At this point Miss O. asked Katherine to take up the lesson and by the questioning method as employed yesterday by passing the story to some other member of the class.

XIX

Miss L. (College Senior)

History—9th Grade—24 pupils—3 college seniors—2-24-17.

3-2-17.

78. Mr. B. (C. S.) conducted the class during the period with frequent assistance from the staff teacher who sat in a rear seat. This was his first experience, which no doubt accounted for his general reticence, but he could have been far better prepared with his material than he was. This would have enabled him to guide the pupils better by the questioning method as they talked to the class on Sulla, Marius, and Mithradates. The other members of the class were supposed to be outlining the talks given. Mr. B's guidance of these discussions I considered very poor. He corrected one pupil who had recited correctly. His general attitude was listless, showing a total lack of enthusiasm. As one well-informed pupil would frantically volunteer for correction while another was reciting he seemed totally baffled by the situation and the staff teacher had to interrupt him frequently to give other pupils a chance to make corrections.*

*Mr. B. was prepared after this day's performance. His failure was attributed to a lack of familiarity with the subject matter of the discussion.

3-15-17.

79. To-day we had a debate on: Resolved, that Caesar was greater than either Alexander or Hannibal.....At the close of the hour each pupil was asked to vote for the three whom they considered the best debaters of the class, excluding themselves of course, (but including us college seniors) and the three receiving the highest number of votes would be selected to challenge three debaters from the morning Ancient History section. This is another splendid idea new to me. To secure competition between sections is certain to inspire pupils to more study and greater progress.*

3-20-17.

80. I was called on to take charge of the class during the greater part of the period. I began with a brief review of the Nationalities represented in Rome about 100 B. C., which helped make up the cosmopolitan spirit..... I adopted the method of rapid fire questions for review, in order to lead up to the advance assignment, but the process of extraction from empty wells was so slow that we did not get to the advance assignment.....After much trouble we finally traced Cicero's travels to secure his education.....The staff

*The three college seniors in this class entered vigorously into the debate, presenting their material in the best form they could work up. Pupils participated in the exercise with great satisfaction.

teacher asked to recite and she went to the map and traced Cicero's travels from Rome to Athens, etc., telling what he studied, etc. She then suggested that all who failed on any part of that discussion be sent to the board to write it now. That was just the most opportune method to employ, but I hadn't thought of it because I hadn't deemed it important enough to spend that much time on it, and I was exceedingly anxious to finish the discussion of the chapter because a review was assigned for the next three days and then a written test.....If I had thought it permissible (it was), I would have had the class take out their books and quickly read the section—then report on it—and thus proceed to the next topic.....The staff teacher assisted me at critical points.

I neglected to include an important thing in the first page of to-day's report. When we began the discussion of the literary men of this first century B. C., I told the class to take up paper and pencil and see how many points they could tabulate for each of the men as they were recited on. This method was resorted to to keep all mentally employed.

3-21-17.

81. Mr. B. (C. S.) took charge of the class for the first part of the period. His preparation was thorough and careful, (See report for March 2), but his questions were phrased indefinitely sometimes. He has a habit of asking "How about" this or that? and the pupils do not know exactly what is expected of them. This became particularly noticeable to me when I was the victim of such a question, and found it necessary to ask for a bit of explanation of just what was wanted before I could answer definitely and correctly. I strive, personally, to have a definite object in view when I am questioning the class and insist upon a response that hits the point in as few words as possible—precision—so that the answer is before the class in a "nutshell," and can then have elaboration without loss of the main point.*

3-28-17.

82. I was asked to take up with the class the discussion of the first examination question: Describe the changes in Roman life, religion and society after the Punic wars, giving reason for these changes. I first called the attention of the class to the fact that the question had three parts, and going to the board I listed them in skeleton outline form, leaving a space between each for a list of changes in each—religion, society and life. Pupils copied it in their note books. When I had finished the staff teacher had revised it by suggesting that the sub-headings under "life" and "society" be all listed under the

*College seniors discuss each others' reports, and in this situation these four in this class conferred with each other and discussed their work. Miss L. pointed out to Mr. B. the main points in her criticism of his teaching. This report was used as a part of their conference. This illustrates a common procedure in the plan of *directed teaching* whenever two or more college seniors are assigned to the same class.

latter, and after I had illustrated the benefit and completeness of answering questions in outline form, whenever possible, Mr. B. took up the second question with the class in a similar manner.

The staff teacher and I agreed after class that when time is limited it would be quite as beneficial for the teacher to put her own outline on the board and have the pupils copy it as a model, rather than extract contributions from the pupils.*

XX

Miss L. (College Senior)

Latin—9th Grade—20 pupils—1 college senior—10-2-16.

(Miss L. is an excellent example of effective participation from the first day and of sustained ability throughout the course.)

11-24-16.

83. I assisted in drilling class in verbs. Had Frances read the principal parts and meaning of a list of verbs written on board, and had a special committee (of pupils) suggest English derivations by which class could learn verbs more easily. Had each pupil check word which he did not know and later had list read. I remained after school to get material ready for scrap book and came out Saturday A. M. from 9-12 and met committees (of pupils) and assisted them in fixing scrap book up to date.

Principles which I have Learned from *Directed Teaching*

- a. Thorough preparation of teacher to secure absolute familiarity with subject.
- b. Economize time, throughout class period.
- c. Keep everyone working all the time.
- d. Thoroughness in connection with essentials.
- e. Dexterous method of handling discussions.
- f. Make daily assignment very clear to class.
- g. Art of skillful questioning.
- h. Have daily program accurately thought out and organized before class.
- i. See relation between order and effective results.
- j. Impress class with importance of daily preparation.
- k. Advantageous use of "margin" of class time.
- l. Teacher should create atmosphere of confidence in pupils.
- m. Encourage mutual co-operation.

*This report illustrates the fact that college seniors are called upon without being notified in advance, that the staff teacher participates in the work of the college senior in giving direction and suggestion at the time work is being done, and further that staff teacher and college seniors confer upon the work of the day.

- n. Avoid confusion, by having machinery of work organized before class.
- o. Start slowly and keep class "above water."
- p. At beginning of year, set standard of conduct and impress this on class's mind.
- q. Encourage initiatory leadership.
- r. Develop respect for teacher's word.
- s. Vary work to avoid monotony and keep up interest in subject.
- t. Check "slumping" etc., at very first evidences.
- u. Present new work, clearly, concisely, simply.
- v. Avoid "nagging" but make all necessary scolding effective.
- w. Insist on pure English.
- x. Be liberal but cautious, in outside help.
- y. Skill in seeking out personal difficulties of pupils.
- z. Tact in meeting problems as they arise.
- A. Encourage evidences of competition, combined with good feeling.
- B. Regulate assignments according to standard of class.

XXI.

Miss S. (College Senior)

Latin—9th Grade—25 pupils—10-24-16.

84. In my preparation for to-day I found that I could translate the sentences on the page assigned, give constructions, etc. with no difficulty. What I did was substantially as follows: I detected a possible reference to the gerundive construction. I was not sure that I would need to explain it inasmuch as I had not a predetermined plan to follow in detail. So I went over that pretty thoroughly so that in the event I should be called upon or in case I had an opportunity to make use of the gerundive I could acquit myself with credit. I thought of some possible stories, suggested by certain material in the sentence exercises. So I reinforced my supply of stories and allusions. Then there was, it seemed to me, a good chance to work on derivative blanks, in case we got along well in the class period. So I arranged some extra material along this line. In all, I spent about two hours in getting a clear background upon which to focus this particular work for the day. Needless to say, I did not expect to use all these points I have mentioned. Nor did I go into detail with minute plans as to how I would proceed if called upon to respond in any one of the many ways this opportunity presents. I am fully aware now that I must have at my command a hundred times more than I can hope to use in a particular class period. One must be fortified in many ways to cope with pupils in a classroom where all work forward and where no upper limit is set for anyone.

(Principal's comment: "This is an excellent example of planning with a view to becoming a director of activities rather than a person who hears a

lesson recited in a formal mechanical manner. It avoids the practice of "siphoning vacuums" to discover by such operation, if perchance, the pupil has been able to absorb an answer to a stereotyped question—a kind of refined guessing contest at best. You will be able to direct activity in a thought-provoking school by such preparation. Preparation of this general sort represents a high conception of teaching. You are enriching your scholarship and at the same time redirecting and refocusing your thinking of subject matter in terms of a working group of pupils, fruitfully directing their activities in a procedure that is full of unexpected possibilities for the exercise of inventiveness in handling pupils.'')

XXII.

Miss H. (College Senior)

Algebra—10th Grade—31 pupils—2 college seniors—12-7-17.

85. The following are some of what I consider the most important things that I learned and that I am sure I shall find useful if I teach next year.

We are dealing with individuals and not a group. Individual differences are great and we cannot expect any two pupils to do the same amount or the same kind of work. For this reason all pupils are to be encouraged to try constantly to surpass their own past record. It is the improvement in one's work that is important. The differences in ability make a fixed assignment an impossibility if we are to have true progress. If all members of the class are to do the same work some will not have to work at all. A plan which does away with these difficulties is to have unlimited assignments and to impress upon pupils the fact that there is no upper limit in progress in any kind of work.

The aim of a class in mathematics is not to give to each pupil a fixed amount of knowledge of mathematics but to train each pupil so that he will be able to express himself correctly along mathematical lines. The ideal arrangement would be to have the class an exact representation of real life so that the child's education would be really a preparation for life.

If the class is to do good work it must be interested. This depends largely upon the work of the teacher. It has been proved in this class that a sure way of keeping the interest is to vary the work each day. The spirit of competition and the spirit of a game also add to the interest of the work.

In all new work in algebra the ideas should be connected with something that the pupils are familiar with so that the work in algebra can be based on arithmetic. On account of the abstract character of algebra the teacher should as far as possible connect every new idea with something which can be seen or felt.

The child learns from doing and not from watching someone else work. It has been interesting to watch the class work out something new. We have

used the plan of first having each one use the idea and after the process was familiar state the rule. It is wonderful the results that can be obtained in this way.

From the little experience I had before the class I learned that a prepared method would be of no use because you cannot regulate the condition of the class. The only plan is to have several methods, and then these would serve as ways to be changed to meet new conditions that might arise. The work with individual pupils is a preparation for the work with the class as a group because it enables a person to understand the pupils and to understand their difficulties. In other words, it makes one see the new work as the beginner sees it. After studying the work in this way we are able to see why some of the mistakes occur and in this way we can avoid them.

I feel now that I would know how to begin to teach a class and that I would have an idea of what to expect from the pupils. I enjoyed the work with them. I think the pleasure would be one justification for the course if that were the only result.

The last part of the course has been the most interesting part so that a greater benefit would be derived if the course continued until the end of the semester. I feel as though the work stops just at the most interesting point.

XXIII.

Miss G. (College Senior)

Algebra—9th Grade—31 pupils—2 college seniors—11-29-17.

86. It is the fine spirit of co-operation between teacher and pupils and between the pupils themselves and the happiness and enthusiasm aroused by the liberty permitted in the classroom that have particularly impressed me in the class I have been in. Only by allowing some liberty can self-initiative and self-expression, two things that a school should aim to develop in its pupils, be gained.

From observing the staff-teacher's work, I have gained some helpful ideas which I shall use in presenting material to a class. One of these is to always get a "point of contact" when presenting new material to pupils. The new must be based on the familiar.

I have learned that to keep the pupils right in the spirit of the work, their leader must keep a good pace. When the pace is slow, a decided slackening in the interest is evident. The loss of speed is often because the teacher's questions come slowly. She should always have a stock of questions ready, so that she will never give her pupils the idea that she is groping for the next thought.

In a subject like algebra where so much of the work deals with abstractions, every opportunity to represent material as concretely as possible must be used. Even the adult's mind grasps the concrete more quickly than the abstract.

A teacher should try to introduce as much variety as possible into her manner of conducting the class. She should use new or infrequent manners of attack so that the pupils may say they never know what's going to happen next. With such variety work will never become dull and monotonous for them.

Above all, if a teacher is to be successful, she must want to teach, she must enjoy working with boys and girls. If she doesn't have this enthusiasm and love for teaching, she had better choose some other profession.

XXIV

Miss L. (College Senior)

German—9th Grade—11 pupils

11-28-17.

87. When I compare my ideals of school and ideas of teaching after my observation and practice in this school with those I had before I came I find there is a wide difference. I can hardly put myself back into the old position—neither do I ever want to.

This work has taught me that the knowledge the pupil gets is of importance to him only as living, usable material. A teacher must cultivate (if possible) in the pupil the attitude of the learner—to see what he can do with what he knows, to interpret new situations in which he is placed. Training a child means to develop in him ability and resourcefulness.

The training has changed my attitude to the pupils. I must be guided in my selection of material according to their definite needs.

I have learned too to take note how the pupil arrived at his conclusions or answer, so that I may be better able to help him and to see where the difficulty lies.

I have also learned many new devices for presenting material in grammar, devices that are not merely drill exercises but some that will help the pupil by making him help himself. I see how important it is to keep the pupils in touch with different lines of work for it gives the pupil a chance for contact with varied material every day.

XXV.

Miss M. (College Senior)

English—9th Grade—33 pupils—3 college seniors—6-10-17.

88. The eight weeks I spent in Mr. P. (S. T.)'s freshman English class gave me some of the most valuable information I have received here, because it taught me to look within for my information, to apply what I had learned, and develop my own method in "meeting the situation." And that, after all, is about the only method one can adopt. Along with a few lessons on

"how not to teach," I have had some on "what not to teach." I think I should have started a first year English class on reading, and had it write only occasionally. Now I see that writing is very important and reading is very difficult; and I should reverse the order I believed in at first. It has been splendid training for me.

XXVI.

Miss F. (College Senior)

English—10th Grade—22 pupils—2 college seniors—6-10-17.

89. I feel prepared now, to at least meet a class for the first time as a leader. When I first stood before the sophomore English class, each child looked about twice his natural size, and I felt as though I was before the most critical of audiences. My experience has taught me, that, although they are critical, the children are sympathetically so, and that it is up to the teacher to show and actually prove that she deserves her place at their head. I noticed that those whom I had helped the most, were the ones who paid closest attention to what I said in class. I could actually see their confidence in me grow at the same time that I was becoming more confident of myself.

Miss R. whose final report is given below (90) goes into considerable detail indicating her attitude toward the course and recording her experiences in working out along the lines offered her in the course. There is no formal requirement of a final report such as this one. College seniors use their own judgment in such matters. They have it impressed upon them that they are making their own record. They are given freedom to use their own initiative in many ways.

XXVII

Miss R. (College Senior)

Mathematics—9th Grade—26 pupils—2 college seniors—5-8-18.

90. One thing which has always been a bugbear of teachers has been the correcting of papers after school hours. They complained of the evil, but went on from day to day requiring the pupils to hand in problems worked at home and then having recitation classes during the period. What good was and is a method of that kind? No good at all. The supervised study method where the greater part of the work is done in the class room is by far the best. The pupils learn to think for themselves and not only to think but to apply what they have thought out. How many of us ever went to schools where we were encouraged to think for ourselves in the classroom? In fact the

thinker was generally in hot water. What was wanted was the thoughts of the teacher or those of the author of the book memorized and returned to the teacher. Mrs. V.'s idea to eliminate the marking of so many papers not only saved her work, but it also put the pupils on their own merit again. When they were asked to hand in a report on a slip of paper at the end of the day telling what they had done, they did it honestly for they were trusted. If you doubt a person he will begin to doubt himself, but believe in him and he will have confidence in himself. Perhaps other ways may be devised which will serve the same purpose and have the same effect, but surely the teacher ought to think of some way to solve the problem, in fact he must do it sooner or later. When asking questions in front of the class I found that there was serious objection to calling upon the same pupil more than once or twice. That is a difficulty which the teacher will eliminate more and more as she learns to know each individual pupil.

What astonished me in the study of Geometry was the rapidity with which the pupils took up the ideas. Their eagerness to progress had not decreased one bit, in fact it was stronger than before; they had a new subject, and consequently there was even renewed effort to get it. Mrs. V. fairly radiated with enthusiasm and eagerness to help them along, so that they progressed much faster than if she had not cared at all, or was merely teaching because she thought that was one of the most genteel ways of earning a livelihood. The ideas of superposition were taught before their books arrived; they did not memorize it from the book, they couldn't, so they had to get it by thinking. Each one had his own triangles and used them to advantage, for thru touch each one learned the facts about superposition.

Right here I might say that the advice of Mrs. V. not to get discouraged after the first or second or third telling was certainly good, for a good many of us make one grand rush and expect the pupils are going to get everything we want them to know as we swish by them without ever letting them taste at all. There were certain fundamental definitions which had to be learned and remembered but she tried to have them work out the proofs for themselves, so that they would remember them, but there were just a few to whom it was found necessary to give the advice that they memorize the proofs. The requirements of accurate form in putting a theorem on the board or on paper were very good. The one thing which I have not yet been able to accustom myself to was the use of so many abbreviations. I was so thoroughly imbued with the idea of writing everything out in full that I could not get the idea out of my system. The idea that everything must have a tag was also very good, for many a time the pupils either would forget to put in the tag or would not know what it was. They practically worked out the constructions for themselves; thru the use of exercises they were taught to work things out for themselves. There was freedom of action and thought, but there was a guiding hand to give them the hypothesis on which they were to work.

The following statement was made by one of the staff teachers with whom the last writer, Miss R. (XXVII), participated. It is an attempt to set forth in a few words the procedure which enables the staff teacher to utilize pupils and college seniors as helpers under the directed study plan.

"I should say at once that the 'student-helper' or 'pupil-helper' emerges from the working group through the need of *partnerships* in teaching.

"Collective teaching is a waste for the great majority of any group.

"Individual teaching makes an instantaneous appeal to every one in the group, and no reward is more sought, more fraught with happiness, than the words, 'Come *help* me, be my assistant!'

"The appealing look of the eager faces as they say 'Will you let me help today?' is sometimes enough to move one to tears. Every boy knows that he cannot 'assist' until he has proven his superiority in the group by some fine piece of work. Often the statement by the boy of 'his rule' for a process, is clearer, more thorough than that of a text. He is not hampered by the nomenclature, the abstract vocabulary of the school-men. He says what one must *do* in a certain process, in limpid, vivid, direct phrases of his mother tongue, and with a singleness of purpose thrusts straight at the procedure. His ingenious methods of illustrating his point often shame our formalism.

"To a student from a higher institution this independent pulsating class-life is sometimes almost shocking, and the first reaction is to make a stand against the indomitable will of the boy to act and think for himself with *freedom*.

"But as the alertness of the boys leaves the older student often gasping, and the surge of earnest criticism pricks the bubble of his conceit, he learns that he too must prove his superiority in order to gain respect; he too must strive for *accuracy* and *originality* and *speed* if he can win the right to 'assist today.' "

XXVIII

Miss R. (College Senior)

English—11th Grade—20 pupils—2 college seniors—12-7-16.

91. I had made my own outline previous to the class work, but I departed from it and rearranged the wording so the students themselves worked it out. (Miss R. at the board in charge.) I think that I never rejected any phrasing or heading suggested by a pupil without having him see that there was no material to be grouped under it. I found out that I had developed some confidence in having definitely and laboriously planned a detailed outline of the work before class and going in and changing the whole plan. I felt that I knew the thought, and I tried to keep looking at various ideas from several different angles, accepting the thought of the pupils and helping them to work out exact phrasings of it. I seemed to grow in self-assurance and in analysis of the pupils' likely responses to the situations. I felt more alert during this period, and more tired after it than during any period up to this time—though I enjoyed every minute, and the time flew.

(Teacher's comment: "Typical teaching—one might say working—experience. An example of the freedom that comes from thorough preparation on any basis; though the class period may work out on another plan, 'Man Thinking' easily finds his place in it.")

1-24-17.

92. I have noticed in class that the teacher is very well informed on many topics of local, national, and international current interest. I try to keep up with usable material which comes out in the current magazines and in the *New York Times* and its Book Review—but I find it very difficult to keep up on Madison events and other newspaper items.... I consider this reading, however, an important part of a teacher's study. I am enrolling in Extempore Speaking next semester just to check myself up severely in this line of work—and to keep myself reading and studying topics which I might otherwise pass over. There is no telling but that a teacher's ability to talk and be interested in some certain topic of current interest might establish a meeting point or way of interesting some pupil who could not be reached in any other way.

Mr. N. (below) started in with a settled conviction that the subject could be developed in a perfectly logical order and that a certain formal method could be followed, no matter who the pupils might be. The claims of subject matter fully possessed him. He was unwilling to believe that we have to teach the subject to *individuals*. For nine weeks there was no gripping of the procedure.

It seemed impossible for him to enter vitally into the work of the class. There was no joyous and free participation. The fact is he continued to be an observer, standing apart trying to see what was going on. Rarely did he get at the inner meaning of things. His mind worked in a mechanical fashion. He was fitting circumstances to labeled pedagogy or tacking labels on what he thought he saw. There was little, if any, first hand, critical and independent thinking. Brief unproductive reports were perfunctorily written. Conferences were had with staff teacher and principal with great frequency. He was not received by the pupils with enthusiasm simply because he did not distinguish himself in competition and association with them. Finally, he was given a new situation. He had reported the allotted time. The plan is to extend the student's participation in the course in the event he does not make satisfactory progress. Accordingly a new assignment was made; a transfer from American History to Ancient History. At once Mr. N. began to show capacity for growth, independence of judgment, and self-direction. He came to a new view, not by external pressure or authority, but by taking hold of a new situation with a determination to discover for himself the significance of genuine participation and self-activity. He began to produce some remarkably fruitful diaries and finished the course in a gratifying manner. A few complete daily reports are given below.

XXIX.

Mr. N. (College Senior)

History—12th Grade—16 pupils—1 college senior—10-9-17.

93. After a brief quiz on the exploration period, the class began the discussion of Virginia. In order that their attention might be kept on the work (1) the pupils were told to stand up. I was sent to a blackboard map to outline boundaries of Plymouth and London companies. Map work is my special weakness (2) and I always lose my nerve in class if I am called on to locate boundaries that are not well known. The recitation was quite snappy (3) and some of the pupils did very well indeed. When the staff teacher assigned the lesson she asked if it were not a short one. The pupils admitted that it was, a thing which my class never did when we were in High School (4).

(Staff teacher's comments: "(1) Not at all. (2) Better become strong

in it for we do a great deal of it. (3) What do you mean? (4) In giving your report, talk to the pupils. Prove your superior scholarship. How and why are things done this way? You haven't even told how the recitation was conducted.'')

10-10-17.

94. I was called on for a report on the founding of Quebec. Although the report was not criticized, I think I failed to make it very concise. At least that was my feeling while giving it.¹ One thing gratified me. That was the fact that I did not lose my nerve when called on for the geography, as I invariably have done nearly all my life. I was also called upon to criticize a report or a summary which one of the pupils put on the board. I began finding flaws in it as soon as I started. I had not gone far when the staff teacher interrupted with a statement to the effect that it was very good. I expect that this was an implied rebuke. I once had a music teacher, under whose instruction I made good progress that never bothered about praising my work. I suppose I shall have to break away from his influence in this matter and give pupils some encouragement in their work. It is, no doubt, as important for them to know wherein they have succeeded, as it is to know wherein they have failed.²

(Staff teacher's comment: ¹It seemed to me you were quibbling over very small points in an exceedingly good paragraph. ²When you rise to help, talk to the pupils, not to me. I probably know what you are driving at; they do not. This report is inadequate. You say nothing of the hows and whys of the recitation. Have you made any effort to know the pupils? I should be glad to have a conference with you.)

Mr. N. (went into a new class at this time)

History—9th Grade—24 pupils—1 college senior—1-8-18.

95. (First day in new class). Well, the "new-boy" feeling although it showed itself in one or two instances was much less strong than it was when I entered the other class (1). I feel sure that I shall feel more at home here in a few days than I ever did in the other class. The general atmosphere in the classroom was what struck me most favorably. Everybody seemed eager and willing to give the best that could be given. We refreshed our memory in regard to things geographical by drawing a map of Greece and putting in as many names as we could remember. Then there was an exceedingly rapid review of the careers of Philip and Alexander. Then after a little study, a few of us talked over the division of Alexander's empire. It was here that I felt like a "new boy" and I found it hard at first to try and create situations in my own mind in case I should have been made responsible for any situations which might have arisen (2).

(Staff teacher: (1) Of course—One of the great values of the course.

(2) Your former experience has undoubtedly helped you to make this good beginning. Don't lose a minute in becoming acquainted with these boys and girls and in participating to your fullest capacity. You did well to-day.)

1-9-18.

96. I was very glad when 1:20 came to-day in order that I might have the privilege of working (1) with the pupils who made such a good impression on me yesterday. I was not disappointed for we had a very instructive session and I think Miss O. (S. T.) must have felt satisfied that the pupils received full value for each minute spent in class.

Then we discovered three problems on the board (2). One group was ready to begin on the second problem immediately after the first one had been worked out. After this the remainder of the class worked out the second problem. We brought out all the points necessary, but I have a feeling that Miss O. (S. T.) was more successful in having the pupils make the points than I was (3). Lazare and Willis then professed themselves to be ready to discuss the Seagnes. We were joined by another boy in a few minutes. They knew a great deal about them, but were not as accurate as the class standard demands. Upon Miss O.'s suggestion they decided to study the subject thoroughly (4).

Some of the pupils did very well in bringing out the characteristics of "The Dying Gaul" and also the significance of the work (5).

Staff teacher: (1) Good. (2) How was the first group started? Who were in it? Were you there? (3) Why? (4) What does this situation prove to you? (5) What a different report! You are on the right track. Keep at it. Record your participation and reaction. How did you go about the business of being chairman?)

1-15-18.

97. I made an important resolution in class to-day. For sometime I have been convinced that the old formal method of conducting a recitation could be superseded by something much more productive. But by nature I am an extreme conservative, and it is very hard for people of my type to break away from the old. Logically I should have resolved not to conduct my classes in the old way as soon as I found that it was less productive than the plan I had been observing. But logically or illogically, I could not bring myself to the point until to-day. Since the class period this afternoon, although the old keeps pulling me back, I don't think I shall ever be satisfied to conduct a class in the old way. More action can not help but be valuable. There is nothing wrong with the theory back of it and to-day I finally became convinced that it was practical. It is not only what I saw to-day. My conclusion comes as a result of many days' observation. To-day was merely the culminating point in the process. Had I reached the conclusion some time ago, it would have been better for me. It was rather a queer position that I was placed in. I went out there each day

to observe a scheme that I did not want to enter into the spirit of. The old had been tried. It had worked. Why bother about changing it? It was in this spirit that I was trying to co-operate in the work. When it came to reporting my mind worked something like this: "I'll never use anything but the old formal recitation. It's plain that the new is working well but I don't want to admit it. To avoid admitting the fact why I'll say nothing about it." It was natural for those who read my report to conclude that I had not grasped the fundamentals at all. And so it was made difficult for every one concerned. To be perfectly frank, I felt like dropping the course several times. However, I am not at all sorry that things turned out as they did, for in spite of myself I became convinced that the old formalism should be abolished, and a little later that I would abolish it.

The point in to-day's class period at which I made my resolution was when I was watching the pupil teachers go over the lesson with those who had completed their study later. That was the culminating point in the process by which I became convinced that the old formality should be and would be banished from classes that I should have anything to do with. Miss O. (S. T.) helped it along by throwing me one of her timely asides which have been very instrumental in convincing me of my foolishness in refusing to get away from the old idea.

The teaching personality is a thing that still worries me more than it ought to at this stage. It is hard to describe the state of my mind in this respect. As far as I can see it's an abstraction that I cannot tear to pieces and analyze. The fact that I can not do this worries me. Because it's something that differs with every individual, I suspect I'll never be able to do it. Anyhow my ideas on the subject are less flighty than they were when I was in the other class. And I feel more confident that I shall be able to get some sort of a hold on my classes next fall. I have had the privilege of meeting one or two of the pupils since I left the other class, and found that I had made a better impression than I thought I did. I feel that it is something which must be developed. By the way, this is another respect in which I worked at cross purposes with the aim of the course. As I remember it I did not conceive of the necessity of making an appeal until I had a talk with Mr. M. (Principal) late in the season. It was then that I began to think about personality and I have been doing it ever since. I expect that is why I get on better in this class. Without competition I feel confident of making an appeal next fall which will be strengthened as my experience increases. I am going to get their respect anyhow.

(Staff teacher: Your new attitude has done more to convince me that we are on the right track than anything that has happened this year.)

Miss Z. (XXX) is an excellent example of an earnest student willing to work and take suggestions. There is evident growth

in power of analysis and in self-confidence. These comments are selected with a view of presenting the student's difficulties and gradual mastery of situations. It is quite obvious that self-confidence increases with sure-footedness in usable scholarship. These two traits appear to run along in her experience as complementary to each other. Miss Z. writes better than one would expect from her performances.

XXX

Miss Z. (College Senior)

German—10th Grade—15 pupils—1 college senior—1-8-18.

98. The class hour was remarkably interesting and alive for the first recitation after an extended vacation. I wondered how the staff teacher could keep the class from dragging, as I had serious difficulty in concentrating and fixing my attention.....

I am growing more and more favorably inclined towards the informal way the class is held. At first I thought the pupils were given too much freedom, but I see that that is what a class room is intended for. The pupils have a right to their own opinion and ought to be permitted to state it. If the body is kept too much in restraint, the mind will be checked too. They must work in partnership, and this is what the discipline maintained at the Wisconsin High School endeavors to do and is certainly succeeding in doing.....

1-15-18.

99. Today I noticed that I had accomplished another point. When I started my *directed teaching* I had very great difficulty in remembering the mistakes, and occasionally found myself marking them, in order to help me to remember them. But to-day I kept track of all the mistakes perfectly, without marking them or anything else.

We made the work lists for the new lesson in the class. Mrs. B. read the sentence, the pupils wrote their unknowns, and I gave the form and the meaning of the unknown. This forms a variation of word list preparation, saves time, and lastly, the pupils think harder and write down fewer words. The word lists from yesterday were handed in, in corrected form. This encourages accuracy, neatness, consistency, careful preparation, memory training in the pupils for they have to strive to hand in their papers in the best possible condition in order to receive credit for the work. The teacher usually gets what she demands, and if all teachers have as high a standard as our staff teacher our schools would rapidly approach a high standard.

XXXI

Miss P. (College Senior)

Chemistry—11th Grade—18 pupils—1 college senior—1-24-18.

100. After John finished his topic I took the class. We went over a review of the last two laboratory periods. I found that it was easier to answer questions than ask them. One time I asked Henry a question and he answered it wrong. Instead of asking a series of questions which would lead to the point I asked if the answer he had given was right. He guessed at the answer this time and hit it right.

Two or three times I mis-stated my question and led to confusion on the class' part. They did not know what I meant.

Then, one time I asked a question which they could not answer, so I told them the answer, and I told them the wrong answer. I must be sure what I am talking about myself before I try to tell the class things.

Twice I let slight mistakes in formulas slip me. These little things are more important in Chemistry than in anything else and I must watch these little things very closely.

My questioning did not last as long as I had thot it would and I was almost at the end of my rope when Mr. D. (S. T.) told me to sit down and then he continued with the teaching. I will have to see next time that my work will last longer and be prepared for questions on review if the topic for the day is exhausted.

(Staff Teacher: Don't be so self-conscious. You had not organized your material as you should. In teaching it is easy enough to plan what you are going to do, provided everything goes as you have planned. Usually situations will come up in class that will require a complete change in your plans, and the good teacher should know just when such a change should be made.)

Mr. M. (below) began his course on a high level and made remarkable progress. He was given a large opportunity in teaching the class throughout the course. On account of the excellence of his work from the start, he was given the chance to substitute some other course. Approval to teach would have been granted after a brief period of participation. Mr. M. preferred to continue the course, feeling that it would prove an unusual opportunity to study problems of teaching on a laboratory basis. The comments included below are intended to present something of the grasp Mr. M. developed in handling real situations.

XXXII

Mr. M.

Agriculture—10th Grade—12 pupils—2 college seniors—5-15-16.

101. I would like to suggest the following plan to be criticised. At the

beginning of each new phase of the work, give each member of a class a card with (in this case) the names of all the important garden vegetables. Have them take these home and check off those (as many as there are days to be spent on the work) that are of most vital need in their case. From these cards select those that are most universally checked, and take a whole day for the discussion of each. After this was done, if there was any time left others might be discussed. It seems to me that this would be very helpful to teacher and student.

(Staff teacher's comment: Your suggestion is very good. It embodies about the same method I followed in this work. I selected plants to study from the experience I have had in this work.)

5-6-16.

102. I took two boys in the class and went over to the high school garden. We selected a suitable place for the frame, and then went over and secured some material. The sash were not of the same length, and the lumber was not very good, but it served for demonstrating material, and the cold frame will be as good for service as finer materials could have built.

Owing to the short time for the work I had to do more myself than I wanted to. I first laid the frames out on the ground and marked around them in the dirt. The boys meanwhile took the lengths and widths of the sash and sawed the boards to the proper lengths. We put the frame together and nailed the outside rectangle. From the ends sawed off we then constructed the center piece, put on the sash for measurements, and put the whole together. I asked why we faced the frame to the south, and they answered correctly that this was to obtain greatest warmth, light and protection. As the hour was over I sent the boys back, and banked in the frame myself.

(Staff teacher: We should have taken the whole class out for this work, or had it as an outside project.)

5-9-16.

103. If the school provided the materials, and the teacher could say when and how this should be done, without stipulations, I would take up the work as follows. I would divide the class into groups of two. I would have each pair of boys make a cold frame, and have the girls make flats (assisting the latter). I would talk one day on flats and have the class take notes, and the next day I would have each pupil plant one row of four varieties of plants, and tell them that they are responsible for those plants. In transplanting I would precede the work with another talk, have the class take notes, and the next day have each one set out the plants he was responsible for. A two hour period is needed for this work. No science needs laboratory hours as much as Agriculture. I would have certain students attend to certain plants from beginning to end.

5-19-16.

104. I took charge of the class to-day for the full hour. We have spent three or four days in having the class make cuttings, grafts, etc., and now I am trying to go back to the beginning, take up orchard management from the start, and by incorporating the actual practice the class has had in the work, arrange the lessons in logical order from the ordering of the trees to the care of the orchard after fruit bearing, my aim being to make each member understand just how an orchard can be started and cared for. I am not trying to crowd the work into a certain definite time, but will develop it slowly, and give time for questions.

I did not make any assignment at the first hour, but let it develop itself in working out the lesson for to-day. I first asked a few questions as to the possibilities of fruit growing in Wisconsin. I then called for varieties of apples adapted to the state, and enumerated them on the board as given. Next I asked what "Site" included, and discussed the factors, soil, exposure, and elevation briefly. I had different members of the class put planting schemes on the board, and emphasized the hexagonal system. I asked for the proper planting distance between trees, and after some discussion gave 20 feet as a minimum. I explained the "ring and wire method" of staking the orchard, and then partially developed the question of what specifications should be in the order of the trees, going just enough into the subject to make my meaning clear, and then assigning this as a lesson.

5-24-16.

105. In a conference with Mr. F. he mentioned that my greatest mistake had been in skipping back to points that I had omitted. I believe I mentioned this yesterday in criticising myself. He gave me some good points about questioning, namely, that the questions should cause the pupil to reason not merely to repeat what he had read. We discussed the points on my cards, and he spoke especially of keeping the whole class thinking even though I questioned the individuals. He said that excessive blackboard illustrations caused the pupils to absorb not think in a profitable manner. This is a good point, and I will try to avoid this mistake in the future.

(Staff teacher's comment on the foregoing and other reports here omitted: As a whole your work was very good: You jump from one point to another and back again. Finish up and go back only to make connections, etc. Your questions are good. Good vein of humor in work.

You find it easier to tell than to develop thru questions. Good questioning is a fine art. Lead pupils on thru actual thinking by carefully worded questions, and still avoid dragging. The questions should develop something. We must avoid making the classroom a place to give back what we have learned.

Mr. M. (Principal) calls this game re-citation. We must get the pupil to think, using what he has learned as a basis for the formation of new judgments developed by skillful questions. The whole class should be in the game of thinking with the pupil you are operating on, otherwise change your course or method of attack.)

6-9-16.

106. This is my last day with the class, and in conclusion I would like to sum up the course as I see it.

First of all, where has it been of value to me?

(1) It has given me confidence in myself. I have been able to forget what others are thinking of me, and give all my energy to the work.

(2) I have been able to see where others have made mistakes, and have added a list of "Donts" to my system. We must avoid all things that tend toward monotony (a) Don't talk in a monotone. (b) Don't address the floor or the ceiling; talk to the class. (c) Don't spend too much time trying to make a student see a point. (d) Don't act bored with the work yourself.

We must avoid extreme informality. "Familiarity breeds contempt" is too strong a statement but it may be kept in mind.

We should deal with great wholes, facts in abundance, but few fine details or complex formulae.

(3) I have learned that the manner of questioning is the great determining factor in teaching.

(4) I have gained some valuable knowledge on the arrangement of subject matter. I have observed that a transition stage is necessary when going from "orchards" to "potatoes." Great leaps leave a vacuum between.

(5) I have added much to my knowledge of Agriculture.

(6) I have learned the value of "illustrative material," and of "action" as well as discussion.

Next I want to express my opinion of the course itself, from the standpoint of the high-school pupils.....

Mr. F. (S. T.) is not attempting to make farmers of the pupils; he is, however giving them a broader outlook on life, and helping them appreciate the things around them.

My greatest problem, in completing my high-school life, was in knowing what profession to choose. This is another thing Mr. F. is doing. This is not mere talk, it is a fact. I have discussed it with the boys.

The work has not, however, developed to its fullest extent. There should be more illustrative material. No doubt this will come in another year.

My greatest objection to the course is the matter of "observers." They come to the class, charged with the idea that they are to pick it to pieces. They do not look back of the questioning to see what is being brought out. They feel, as we all feel when we observe the work of someone else when we have not done the work ourselves, that there are many weak points, but they

do not look for good ones. They take away the attention of the class. They make the teacher uncomfortable; and they gain nothing of value with their fault-finding attitude.

In conclusion I would like to say that my course in Educational Practice has not only been of great value to me from the teaching standpoint; but I have learned more about Agriculture from Mr. F.'s teaching than I have learned any semester in any course in the University of Wisconsin.

CONCLUSION

These two "selected comments" (in reality letters), Nos. 107 and 108, represent a quality of reaction to the work of *directed teaching* from teachers in service. These letters are included in bringing this chapter to a close for the purpose of illustrating one means, at least, of relating the work of the University of Wisconsin to the public education of the state. A vital and fundamental connection is developed in this way between work done in the University and service in the schools. These respondents, together with many others write frequently to the staff of the Wisconsin High School for suggestion in meeting their unique problems. No effort is made to secure an artificial bond of connection. These relationships grow up out of a procedure that appears to the University to have a dynamic in them. This type of reaction could be amplified, but it is believed that the following will serve to point out to the reader, not only the general character of the "after effects" of the participative plan of preparing teachers, but also to illustrate a new outlook upon functional relationship between the college and the high school.

XXXIII

Miss G. First year of Teaching.

2-23-18.

107. As my *directed teaching* in the Wisconsin High School has so very often been such a source of thankfulness to me, I want to show in some measure my appreciation for the opportunity of having preparatory work in the Wisconsin High School.

I wonder sometimes what I should have done without that preliminary training. The ideas which I received there, combined with the privilege of testing those ideas, I am sure have been worth at least two years of regular teaching to me.

Most new teachers, I imagine, whatever their training, are rather nervous

during their first weeks of teaching. How much this conviction was alleviated in my case, I think I shall never be able fully to appreciate.

The ability to expand ideas received from the guiding teacher and the power to develop ideas, I think are the two best results a teaching candidate will obtain from the immediate association with an experienced teacher who well understands his work.

Whatever I have been able to do other than humdrum work, I feel that I owe directly to my participation under the direction of Mr. P. (S. T.) in the Wisconsin High School.

What I have written I know cannot convey my appreciation to more than a slight degree, but I hope that you will feel that I am exceedingly grateful for the opportunities which my state through the Wisconsin High School has been able to do for me. I know that it is my duty to attempt to repay my obligations by most conscientiously doing my best.

XXXIV

Miss C. Second year of teaching.

6-12-18.

108. Now that I have completed a year and a half of teaching, it is interesting to consider how much my work at the University High School has aided me.

On that September morning when I first stood before those attentive pupils, curiosity written all over their faces, I was not afraid, but only glad that I now could start real work. During the first few weeks Miss G. and I often spoke of what a difference it would make if we had never before faced a class, never analyzed real class work, and never formulated objectives toward which to work. If the service of the Wisconsin High School to me had ended here, in giving me the right sort of a start, I would have been very grateful.

However, as I gain experience, I continually find how to apply phrases which at first I did not fully comprehend. I began to realize a little of what it meant to have my English classes as far as possible "a laboratory group," to "have no upper limit to the assignment," to give the "problem attitude," to have "the forward look," and so on.

Of course it would take years for me to work out the complete practical application of these ideas from day to day. But what an opportunity for the use of one's originality and inventive genius. Teaching cannot but be a happy, dignified, artistic profession, I think, when we teachers strive to teach attitudes, the power to think, and self-expression.

Wouldn't it be splendid if teachers all over the country could have such a start as the University High School can give? I hope they may, some day.

SECTION II

MISCELLANEOUS PROBLEMS IN THE PREPARATION OF HIGH-SCHOOL TEACHERS

CHAPTER I

THE SELECTION AND THE TRAINING OF TEACHERS FOR JUNIOR HIGH SCHOOLS

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The most difficult problem connected with the establishment and the maintenance of junior high schools is the problem of securing teachers who are trained for their work. Though the necessity of having qualified teachers is pressing in all parts of the school system, this necessity is most urgent in the junior high school, because the junior high school is a new institution with a new program of studies and with a new social purpose. If the teaching in this new institution is to be done by teachers who follow the old traditions and who fail to catch the vision of a new method and a new opportunity, it is not likely that the junior high school will be able to accomplish the purpose for which it was intended.

PURPOSE OF THE JUNIOR HIGH SCHOOL

What is the purpose which the junior high school is expected to accomplish? The purpose of the junior high school is to offer a program of studies which shall be suited to the varying needs of boys and girls in their early adolescence, to take into account the individual differences among boys and girls, to assist boys and girls to develop right attitudes toward life and its problems, to assist them in discovering and in developing their natural aptitudes, to

guide them carefully by a wise discipline through the trying time when they are passing from the period of control imposed by others to the period of self-control, to take into account their budding idealism and their emerging religious concepts, to give them opportunities for expressing their social instincts in helpful and inspiring service, to correct physical defects and to build up habits of clean and wholesome living, to acquaint boys and girls in an elementary way with the social, the economic, and the political problems which they must face in the world outside of school; to inculcate in them both by theory and by practice the principles of good citizenship; to induce as many as would profit thereby to go on with their education in higher schools; and to give to those who must take up at once the toil for daily bread a good start by way of special, though elementary, vocational education. In brief, the purpose of the junior high school is to be a friend of adolescent boys and girls by giving them a full, rich, and joyous life,—full and rich and joyous in the present and for that very reason full and rich and joyous in the days and the years to follow.

Such a program as this is not the program of the seventh, eighth, and ninth grades in the school system which is organized on the conventional basis. Consequently, teachers who are trained to fit into a school organization which is wholly different will not be so likely to do well the work of the junior high school as those who have specific training for the particular problems which they will be called upon to solve.

Since the organization of junior high schools is proceeding at a very rapid rate, it will not be possible to give a satisfying training in advance to all the teachers who will be needed. We must get the best available teachers and train them after they have entered upon their duties. Although there will be considerable loss in efficiency on account of this trial-and-error method, it is important to remember that experience may be depended upon to adapt those new teachers to their work if only they have the aptitude and the proper attitude.

The aim of this paper is to set forth certain standards that seem to the writer to be fundamental in any plan for the selection and the training of teachers for junior high schools. In the first

place, we must consider the practical problem of making the first appointments in the new schools that are to be established. What is to be the source of supply from which the first teachers shall be drawn and what shall be the basis of the selection?

QUALIFICATIONS OF SUCCESSFUL JUNIOR-HIGH-SCHOOL TEACHERS

Before these questions can be answered we need to know the distinctive qualifications of successful junior-high-school teachers. What are the differentia between successful junior-high-school teachers and successful teachers in any other department of the public school system? The qualities that would make a person a good teacher in the kindergarten and in the first grade are not the same as are required in the twelfth grade. It is not at all a question of honor, of importance, or of emolument. The only question involved is the fitness of the person to do the work that is required. So far as the junior high school is concerned, the fitness of the teacher involves thorough scholarship, a large and generous and inspiring personality, adequate professional training, understanding of, and love for boys and girls in their early adolescence, qualities of real leadership, and a broad social outlook which will result in positive service in the school and which will connect the school and its pupils with the social environment outside. It is commonly said that the teachers in the elementary school need more sympathy and less scholarship than the teachers in the senior high school. This bold generalization has at least this element of truth in it, that teachers in the elementary school need a large amount of the human qualities of love, of patience, and of sympathy with children and that senior-high-school teachers need a thorough understanding of the subjects which they are called upon to teach. The distinguishing characteristics of junior-high-school teachers are that at their best they exhibit both broad human sympathies and sound scholarship and that they respond generously to the new social demands which a progressive educational program is making upon them. In other words, the successful junior-high-school teacher must combine the distinguishing qualities of the successful elementary teacher and of the successful senior-high-school teacher and in addition must have an unusual

willingness and ability to respond to the opportunities for usefulness which only a broad social outlook and a keen sensitiveness to social obligations can give. . .

The reasons for this need of superior qualifications on the part of the junior-high-school teacher are found in the nature of the material with which he has to deal. He is dealing with boys and girls at the most critical period of their lives—at the time when physical, mental, and spiritual changes begin to be most marked. There is no need of argument to prove the assertion that early adolescence is the most critical period in the life of youth, for educators generally have accepted the assertion as true. After all that has been said and written about this most important period in the life of the growing boy and girl, it would be a work of supererogation to record here the scientific investigations and discoveries that have been made. Adolescence throughout its whole duration is the period when youth experiences its greatest changes. If at the onset of these changes youth can be put into the proper environment and subjected to the regimen best suited to its needs, there is good reason for expecting that the succeeding crises will be met safely as they occur. To know the dangers and to appreciate the possibilities of children in the ages from twelve or thirteen to fifteen or sixteen require understanding, tact, and sympathy of the highest order.

SOURCE OF SUPPLY OF JUNIOR-HIGH-SCHOOL TEACHERS

In the light of this statement of qualifications we return now to our earlier question: "What is to be the source of supply from which the first teachers shall be drawn and what shall be the basis of the selection?" Both theory and experience indicate the desirability of making the first appointments to newly-organized junior high schools from groups of successful elementary school teachers. These teachers, especially if they are selected from the seventh and eighth grades, will have the initial advantage, a very considerable advantage, of having dealt with pupils who are of junior-high-school age. They will know at first hand some of the problems which they will meet in the new organization. Furthermore, elementary teachers as a group are more likely than senior-

high-school teachers to have had training in pedagogical methods and in the history of education. Training of this kind will be of inestimable value to the members of a junior-high-school staff. If to these qualities of successful experience and of pedagogical training can be added those other qualities which come from adequate scholastic preparation in college and university, from the youthful spirit, and from natural or cultivated social vision, we shall have almost ideal fitness for junior-high-school work. The senior high school, too, sometimes has in its corps a teacher who possesses all the qualities we have mentioned. The best senior high schools have many such teachers. When the conditions are right, both the senior high school and the elementary school should be called upon to assign the members of their staff to places where they can do the most good. Fortunately, some school systems, especially in the larger cities, are able to find among the teachers already in service a sufficient number with the necessary qualifications to fill the new positions in their junior-high-school organization.

In many small communities, however, and in some large cities where the standards of appointment have not brought teachers of high endowments into the elementary schools, the problem of making the first appointments to the junior high school will be more difficult. It is scarcely worth while to undertake the task of organizing the junior high school, with all of its complex problems, unless the teachers who are to be selected for the work show some promise of grasping the meaning of their new responsibilities and unless they possess some ability to measure up to their new obligations. Native ability, especially if it be easily adaptable to new conditions, sometimes may be accepted as a substitute for specific training. Each superintendent who plans to establish a junior high school will do well to consider the availability for appointment of the teachers who are already doing work in the upper grades, especially in the seventh and eighth grades. Unless he can find promising, even if untrained material in this group, he most likely will do well to postpone the institution of his plan to a more favorable time.

SALARY SCHEDULES IN THE JUNIOR HIGH SCHOOL

Since the junior high school at its best involves a longer school day than is customary at present and since the qualifications of teachers are necessarily of the high order already referred to, it is unreasonable to fix a salary schedule for junior high schools below that which is fixed for senior high schools. Indeed, there are good reasons for saying that in the junior high school, on account of the critical nature of their work and the heavy tax upon their energies, the teachers should receive higher compensation than is paid elsewhere in the system. Perhaps after the new institution is firmly established in the understanding and in the affections of the people this higher compensation will be granted freely in recognition of the measure of service rendered. In the meantime the tendency manifest in some places to establish a salary schedule that is intermediate between the schedule of the elementary school and that of the senior high school is to be resisted strongly, because it not only fails to recognize the importance of the junior high school and the significant contributions of its teachers to the development of a difficult piece of work, but also it strikes at the stability of the new institution by the subtle suggestion to teachers that they may regard their position merely as a stepping stone to the safe berth and the higher salary which the senior high school offers. In other words, the intermediate salary creates a condition of unstable equilibrium, whereas fixedness, firmly based in high purposes persistently followed, is needed to develop the junior high school up to the full measure of its possibilities.

In some places, junior-high-school teachers who have been assigned from the senior-high-school corps have received higher salaries than have been paid to those who were appointed from the elementary school. This practice has produced friction and discontent and has had a tendency to disrupt the organization of the school. The only safe rule to follow is to fix definite standards, not wholly scholastic in their nature, and to pay the same salaries to all who can meet the requirements. If for any reason there is need of appointing teachers who can not measure up to the standards that are set, a plain statement of the reasons for the appoint-

ment and for the salary that is paid will allay unrest that otherwise might develop. Sometimes it is necessary to appoint to special work, like that of drawing or music or industrial arts or household arts, teachers who do not conform in full to the standards which the other teachers in the school have met. Appointments of this kind are justifiable for special reasons. Differences in salary are justifiable for similar reasons. It is not justifiable, however, to base the differences in salary solely upon the fact that some teachers have been appointed to the junior high school from the senior high school, while others have been appointed from the elementary school.

METHODS OF TRAINING TO MEET THE REQUIREMENTS OF THE JUNIOR-HIGH-SCHOOL TEACHER

The standards which have been fixed in the best schools have already been mentioned. They may be summarized as follows:

- (1) Graduation from a reputable college or university;
- (2) Professional training in a normal school or in a school of education connected with a university; or in lieu thereof, successful experience in teaching;
- (3) Understanding of, and sympathy with adolescent boys and girls;
- (4) A clean, generous, and inspiring personality;
- (5) Qualities of real leadership;
- (6) A broad social vision and a keen sense of social obligations.

The last four of these requirements may be called "moral" as distinguished from the first two, which are "intellectual." No one who is unable to meet the moral requirements in full should be appointed to the junior high school. The intellectual requirements may be relaxed somewhat in special cases when the successful experience of the teacher or his scholastic training in ways which did not bring him a college degree warrants special consideration.

The intellectual requirements for teaching in the junior high school are as high as those required for teaching in the senior high school. Some persons have said that the junior-high-school teacher, because he is dealing with younger boys and girls, does not need to

know his subject matter so thoroughly as the senior-high-school teacher needs to know it. The fallacy in this argument lies in the assumption that thorough knowledge is not necessary in the teaching of the elements of a subject. All our experience contradicts this assumption. Unless one knows the farther reaches of a subject he is not a safe teacher of the elements. By favoring fortune he may avoid serious errors, but he is not likely to avoid them. In any event, he can not be the inspiring teacher whose insight can create in pupils a desire to know more. Boys and girls from twelve to sixteen years of age are very critical. They find it easy to ask questions and to detect shams. The superficial teacher can not meet the needs of these boys and girls.

Whatever concessions may be made in the case of teachers who are already in service and who for various reasons may be assigned to the junior-high-school staff, there should be no deviation from the fixed standards for those who are taking the training in preparation for a first appointment. We have not advanced very far as yet in the measurement of the moral qualities. We still are making naïve judgments, and doubtless we shall continue to make them for a considerable time to come. Without having definite scales for measurement, we know that certain persons are just, and sympathetic, and inspiring, and gifted with qualities of leadership and that certain other persons are lacking in all those particulars. In some ways observation confirms our judgments. For example, a man or a woman who enjoys and who has had successful experience in conducting clubs of boys or girls, who has been a leader of Boy Scouts or of Girl Scouts, or who has in other ways demonstrated inspiring leadership of youthful activities is more likely to succeed as a teacher in the junior high school than one who is without such experience. In the training school, opportunity for leadership of this kind should be afforded very generously in order both to test and to train the capacity of the candidates for positions.

The religious and the social instincts of youth begin to emerge at the age of twelve or thirteen. Unless at this time boys and girls can have the influence of the leadership of wise, true, and generous men and women, the loss thru atrophy of power is likely to be very

great, indeed. For the present we need to pick our candidates for junior-high-school positions somewhat after the manner that has been adopted for the selection of the Rhodes Scholars in Oxford University. These Rhodes Scholars are expected to show a combination of high scholarship, of athletic ability, and of leadership of men. No hard and fast rule is laid down, for it is impossible in the present state of our knowledge to set up scientific objective standards of measurement. In a similar way, it is impossible to set up suitable objective standards for the selection of junior-high-school teachers. In general, however, it may be said that no one should be selected for junior-high-school work unless he has in addition to adequate scholarship those moral qualities without which scholarship alone is an empty shell.

Assuming, then, that the potential moral qualities are present in the prospective teacher we have still to determine precisely the professional training which should be supplied. As has been said before, this professional training should be added to, not substituted for, the academic education in college or university. Graduation from the high school alone will not suffice for the mastery of the one or two major subjects which the applicant may elect to teach. Indeed, it is assuming a good deal to suppose that even graduation from college will give a mastery of any subject. Nevertheless, in the present state of public opinion, that public opinion which fixes the salaries of teachers, it is not likely that more than the first college degree can be required as an evidence of academic qualifications.

Some institutions follow the practice of including the professional subjects in the list of subjects required for a degree. This practice is entirely legitimate in those places where the community needs education in the value of adequate preparation of teachers. It can be accepted, however, only as a temporary arrangement pending the time when higher standards may be established. To include professional training within the scope of the college course means the elimination of some elements of academic study and the reduction of thorough academic education in proportion to the amount of elimination. Ultimately this nation can not afford to recognize a 'syncopated' education of its junior-high-school

teachers; it can not afford to accept anything less than a full academic education of at least four years supplemented by professional training in addition.

The collegiate education of the prospective junior-high-school teacher should follow the approved plan of the group system. At least two major subjects should be pursued with considerable thoroughness. A part of the minor subjects should be related closely to the general departments to which the majors belong. Other minor subjects may be chosen according to individual interests only. Courses in psychology and in sociology, although they are indispensable foundations for later professional training, are in themselves of sufficient general, as distinct from professional merit to warrant their inclusion in the college course.

All that has been said up to this point refers to the training of teachers of academic subjects. It is not likely that for many years to come the teachers of special subjects, such as drawing, music, physical training, and the household and industrial arts can be expected to subject themselves to the same rigorous scholastic discipline as is required of academic teachers. It will be better for our whole educational system, however, if the teachers of these special subjects can have a more thoro general education than is now customary. At present, the teachers of special subjects are too highly specialized to make their contributions to the education of boys and girls as valuable as the intrinsic merit of the special subjects demands. However, it is better that the teachers of special subjects should be masters of their fields of instruction even at the sacrifice of some general education than that they should be mere dabblers, unable to command the thoro respect of their pupils thru their technical attainments. Nevertheless, professional training is necessary for this group, as well as for the teachers of the academic subjects.

The following professional courses including several that may properly be taken as a part of academic education will give the irreducible minimum of training for the best type of junior-high-school teaching of both the academic and the special subjects:

1. General Psychology
2. Educational Psychology

3. Genetic Psychology
4. The Psychology of Adolescence
5. Philosophy and Ethics
6. The History of Education
7. Principles of High-School Education (with systematic participation in schoolroom activities)
8. School Hygiene
9. Social Education
10. Sociology
11. Special Methods (in subject or subjects the student expects to teach)
12. Mental Tests and Measurements
13. Vocational Guidance

This program as a whole does not differ widely from the program which will commend itself as suitable for the training of teachers for senior high schools. The last two courses, however, are of special importance for junior-high-school teachers. As our psychologists develop and improve the methods of mental tests and measurements, school administrators and teachers are finding these tests increasingly useful in classifying pupils according to their abilities and their needs and in adapting instruction to the various groups which the tests reveal. Although tests and measurements are useful in every grade of the schools, they are almost indispensable in the junior high school, where differentiation of abilities begins to be most clearly marked and where this differentiation should be definitely discovered by the teacher and definitely provided for by curriculum adjustments.

Though we do not know very much as yet about vocational or educational guidance, there is good reason for expecting a considerable increase of knowledge in this field in the near future: There is very little disagreement about the great value which educational guidance would contribute to the schools if only we knew how to apply it. The objections usually raised are based upon our lack of knowledge. Though our lack is lamentable, indeed, we do know a little, and we should not hesitate to use even this modicum. Furthermore, as experience in other directions shows, there is every reason to expect that our knowledge in the new field will develop as we use our present possessions and reach out for more. The

junior-high-school period is a time when boys and girls are making rapid strides in discovering and developing their latent abilities. It is the function of the schools to assist in the discovery as much as possible and to give to uncertain tendencies the wisest guidance in their power to bestow.

In order to complete the training which the professional studies outlined above should give, it is necessary that the student should have practical experience in the schoolroom by participation in the activities of the recitation. Out of justice to the pupils of the school we must hope that no plan will be adopted whereby the student-teachers will experiment as does the chemist in his laboratory. Participation in the activities of the schoolroom under the guidance of an experienced teacher is a very different thing from complete control of these activities by one who is wholly inexperienced. Moreover, if the success of the plan of participation is a criterion, we have good reason for thinking that better results in teacher-training are to be obtained by this method than it is possible to obtain under the older method of turning a class over wholly to a novice. The old method is quite comparable to the practice, sometimes followed in the teaching of swimming, of throwing a learner into deep water and telling him to swim out to safety. Since the method of teacher-training by participation in the activities of the recitation is explained in full by Principal H. L. Miller in Section I of this Yearbook, it is unnecessary to go into greater details in this place.

Although no institution in the country has set a standard of training as high as that outlined in this paper, it is interesting to see that there is an increasing number of institutions which are giving recognition to the needs of the junior high school for properly prepared teachers. Both colleges and normal schools are introducing courses designed to meet the special needs of the new institution.

In view of this recognition, rapidly becoming more generous, it is not too much to expect that standards approaching those herein set forth will ultimately prevail. There is no doubt that standards at least as high as these must ultimately prevail if the junior-high-school teacher is to meet his responsibilities and his opportunities

in full and if teaching in this department is to be a real profession and not merely an occupation.

PRESENT COURSES FOR PREPARING JUNIOR-HIGH-SCHOOL TEACHERS

The degree to which some of our colleges and normal schools are responding to the need for the new training is shown in the appended statements taken from the announcements and catalogues of the institutions named. No mention is made here of those courses which are of a general nature and which are intended either as a requirement for all prospective teachers or as a requirement for senior-high-school teachers only. Only those courses are included which, according to the description given in the catalogues, are shown to be intended explicitly for junior-high-school training. The numbers preceding the description of the courses are the catalogue numbers. The quotations are not given in full but limited to phrases that are significant for the purpose intended.

COLLEGES AND UNIVERSITIES

California, The University of (Announcement of Courses, 1918-1919)

108B-108C. Modern Methods in Elementary Instruction.

A course primarily for teachers in service. The first half-year will cover the work of the first six years of the elementary school; the second half-year, the intermediate-school years.*

112. The Intermediate (Junior High) School.

The development of the movement and the specialization of work for the intermediate school.

215. Special Studies. The intermediate school.

119. The Principles and Practice of Vocational Guidance. (In Summer Session Bulletin, 1918.)

The aims of vocational guidance; effective educational and vocational guidance in the elementary, intermediate, and high school; play, scoutcraft, camps, student activities, self-government, and other experiences as aids in self-discovery and in developing characteristics useful in occupations; the subject matter and method of the life-career class in schools; the relation between vocational guidance and vocational education.

Chicago, The University of (General Announcement of the School of Education, 1918-1919.)

*In California, the junior high school is called the intermediate school.

36. High-School Administration.

This course deals with the practical problems of high-school administration, including the relation of the high school to the elementary school and to the college; the junior high school.

38. Junior High Schools.

A survey of the evolution of the present divisions of the school system and of the divisions of European systems. A survey of the progress, in recent years, of the junior high school, including a critical examination of typical courses of study.

58. Prevocational Education.

Purpose: To study the present movement to organize purposeful curricula for those who leave school early. The course discusses the economic, administrative, and industrial phases of the work and its relation to the junior-high-school movement. Courses in English, mathematics, science, industrial history, drawing, and shopwork are examined. Useful to those preparing for administrative work in popular education or for teaching in prevocational or junior high schools.

59. Vocational Guidance.

Topics discussed: Guidance surveys and literature, school records, placement, employment supervision, analysis. Specifically useful for superintendents, principals of high and junior high schools, and for administrators of industrial training.

11A. Organizing Grammar-Grade and Junior-High-School History for Teaching Purposes.

Emphasis is placed on selecting, organizing, and standardizing historical material adapted to the grammar grades and the junior high school.

11B. The Technique of History Teaching in Grammar Grades and Junior High Schools.

A consideration of the following topics as they relate to history in the grammar grades and the junior high school: general and special methods of procedure, dramatization, the history recitation, notebook and written work.

30. The Teaching of the New Civics and Community Life in Junior and Senior High Schools.

A grammar course for teachers and supervisors of the grammar grades and high schools.

93. The Teaching of Industrial Arts.

This course is planned for grammar-grade, junior and senior-high-school teachers, and supervisors of industrial courses.

Colorado, The University of (Summer Session Announcement, 1918)

8. School Administration.

Among the problems considered are the following: financial support, state and local control; the junior high school; supervised study; vocational guidance.

Columbia University (Teachers College Announcement, 1917-1918)

219A. Sociological Foundation of Curricula.

Junior high and senior high schools.

292A. Problems of School Curricula.

Proposed for junior and senior high schools.

297-298. Vocational Guidance.

Vocational guidance aspects of the junior high school work and organization.

289. Organization and Administration of the Junior High School.

211C. Illustrative Lessons in History.

The class for 1917-1918 will be a first year class in the Horace Mann Junior High School.

496. Practicum. Current Problems in Arts Education.

Adapted to junior and senior high schools.

147-148. Principles and Practice of Teaching Industrial Arts in the junior high school.

(Summer Session, 1918)

S289A. Organization and Administration of the Junior High School.

Causes of dissatisfaction with the present organization of schools; approximations to the junior high school; existing junior high schools, their curricula, courses of study, and other provisions for individual differences; achievements; the outlook.

S281A. The Theory and Practice of Teaching in the Junior High School.

S307B. The Teaching of Literature in the Junior High School.

S308B. The Teaching of English Composition and Grammar in the Junior High School.

S212R. The Teaching of Regional Geography in the Junior High School.

S211D. The Teaching of General Science in the Junior High School.

S212T

or

S212P. The Teaching and Supervision of Mathematics in the Junior High School.

S101. Industrial Arts for the Junior High School.

S147. Theory and Practice of Teaching Industrial Arts in Junior High Schools.

Cornell University (Register of Cornell University, 1917-1918; Summer Session)

Industrial Education—C.—Wood Work for Prevocational Junior High Schools.

Dartmouth College (The Catalogue, 1917-1918; Summer Session, 1917)
Education S7. Junior High School.

Harvard University (Register of the Division of Education, 1917-1918)

15. The Reorganization of Secondary Education.

Problems of theory and practice involved in the reorganization of secondary schools. The Junior High School and other plans for the readjustment of secondary education.

16. Principles of Vocational Guidance.

The following topics, among others, will be discussed: the aims of vocational guidance; effective education and vocational guidance in the elementary, junior high, high school and college.

(Register of the Summer School of Arts and Sciences)

S15. The Junior or Intermediate High School and Related Movements.

Plans for the reorganization of secondary education.

S18. Social Studies in Secondary Education, with Special Reference to the Teaching of Community Civics in the High School and Junior High School.

(Brief Announcement of Courses by Division of Education, 1918-1919)

15. The Reorganization of Secondary Education.

The Junior High School and other plans for the readjustment of secondary education.

Illinois, The University of (Annual Register, 1917-1918; Summer Session)

S127. Junior and Senior-High-School Curriculums.

Curriculum organization and special methods in junior and senior high schools; comparisons with foreign and secondary school systems.

Indiana, University of (Bulletin of the Summer Session, 1918)

31. Survey of the Junior-High-School Movement.

Iowa, University of (Catalogue, 1917-1918, Summer Session)

XV. Organization and Administration, Junior High School.

A consideration of the problems to be met in the establishment of a junior high school.

XXI. The High-School Curriculum.

A detailed study of the present practice in junior high schools.

Johns Hopkins University (University Register, 1917-1918)

5. Secondary Education.

This course will deal with the principal topics of high school organization and administration, including important current problems, such as supervised study, the reorganization of secondary education, and the junior high school.

4. Secondary School Organization and Classroom Management.

The junior high school.

6. The Teaching of English Composition in Secondary Schools.

English in the junior high school.

Kansas, The University of (Annual Catalogue, 1917-1918; Summer Session)

XIX. The Intermediate School (Junior High School).

Leland Stanford Junior University (No courses announced in Announcement of Courses for 1918-1919)

Michigan, The University of (Catalogue, 1916-1917)

14. Social Education. Six-year high school.

Minnesota, University of (Courses are projected, but not yet offered.)

Missouri, University of (No course offered.)

Nebraska, University of (Catalogue of the Summer Session, 1918)

15. The Junior High School.

The adjustment of the intermediate school to various demands; to preparation for college and for life, to adolescence, to intended occupations. The junior high school and improved training for vocation and citizenship.

Ohio State University (No courses announced in Catalogue for 1916-1917)

Pennsylvania, University of (Catalogue, 1917-1918)

42. The Junior High School.

This course deals with the organization of the Junior High School, its purposes and the principles underlying the different plans in operation.

Pittsburgh, University of (Bulletin of the School of Education, 1918-1919.)

101-102. High-School Administration.

Special attention is given to mental growth and development in connection with adolescent boys and girls, the organization of the junior high school.

105-106. The Junior High School

The origin, growth, organization, program of studies, curricula, management, and extra class activities, the content of the courses of study.

(Bulletin of the Summer Term, 1918)

111. Junior-High-School Administration.

The aim of this course is to study the problems of school administration that would be met by a superintendent or principal in organizing a junior high school in a town or city.

131. English in the Upper Grades and Junior High School.

152. Civics in the Junior High School.

109. The School Plant. Junior high school.

132. New Phases in Educational Administration. Junior high school.

Reed College (No courses announced in Catalogue for 1917-1918)

Texas, University of (No courses announced in Catalogue for 1917-1918)

Washington, University of (Bulletin for 1918-1919)

119. High School Curriculum.

Consideration of the junior high school and junior college.

154. The Junior High School.

Its functions; relation to the elementary school and to the

senior-high-school curricula, daily programs, departmentalism; promotion; teachers; buildings and equipment; costs; the problem of introducing this reorganization.

(Bulletin of Graduate School for 1917-1918)

252. Seminar in Vocational Education and Guidance.

Vocational education in relation to junior and senior high schools.

Wisconsin, University of

108S. High-School Organization.

Brief historical account of the high school and its antecedents; reorganization of secondary education (Junior and Senior High School); program of studies; principles controlling selection and continuation of courses; aims and processes represented in the major high-school subjects.

Yale University (No courses announced in Bulletin of the Graduate School for 1917-1918)

NORMAL SCHOOLS

Kansas State Normal School, Emporia, Kansas (Descriptive Circular.)
Junior High School.

This school consists of the seventh, eighth, and ninth grades. It has a principal who is also supervisor of history and civics. The principal together with the supervisors of mathematics, elementary and general science, and English have general charge of the management and discipline, while other supervisors are detailed from the Normal School for other lines of work.

Requirements for the Life Certificate to Teach in Junior High Schools.

From eighteen to twenty-four hours; in each of two departments, nine to twelve hours.

Administration of Junior High School Instruction.

Colorado State Teachers College, Greeley, Colorado (Catalog for 1918-1919)

13. Current Movements in Social Education.

It will include a discussion of vocational education, the school survey, and the Junior High Schools.

113. Organization and Administration of the Junior High School.
Organization; standards for judging junior high schools; historical development; the program of studies; the daily schedule of classes; courses of study for the various subjects; the qualification of teachers.
116. The High School Curriculum. A practical study of the curricula of various small high schools and junior high schools.

Cleveland School of Education, Cleveland, Ohio (Bulletin of Summer Session, 1918)

1S. *The Junior High School.*

Organization and teaching in the junior high school.
Supervised Study.

Supervised study will be demonstrated in the several subjects taught in the Fairmount Junior High School.

Massachusetts State Normal School, Salem, Massachusetts (1917-1918)

- Arithmetic 2. Methods of teaching arithmetic in grades 7 and 8 and junior high school.
- Arithmetic 4. Teaching arithmetic in grades 7 and 8 and the junior high school; advanced course.
- Geography 3. Junior-high-school geography.
- History and Social Science
3 and 4. American history and methods in teaching history and social science in grades 7 and 8 and junior high school.
- Practical
Arts 4. Intended to familiarize the pupils with the courses of study, methods and demands made upon teachers in grades 7 and 8 and the junior high school.
- Fine Arts 4. Methods and practice for students preparing to teach in grades 7 and 8 and the junior high school.
- Bookkeeping 5. Junior-high-school bookkeeping and penmanship.

Oshkosh State Normal School, Oshkosh, Wisconsin (Catalog for 1918-1919)

- IX. A three-year course, to prepare for teaching in Junior High Schools.
- XIII. *Course for Training College Graduates for Teachers or Principals for Junior High Schools.*

Educational Sociology: Discussion of the junior and senior-high-school program of studies in the light of various criteria of subject values.

(Catalog of Summer Session, 1918)

Educational Sociology: Discussion of the junior and senior-high-school program of studies.

Principles of Secondary Education: Principles which should govern the organization of the junior-high-school course of study.

The survey just given of work offered in colleges and in normal schools is by no means complete. The aim is to show by the published reports of a large number of colleges and of a few normal schools that both types of institution are making a beginning in the development of courses that are intended to be of direct and special value to teachers and to administrators of junior high schools. In only a few instances is there even a slight approximation to the plans which must be instituted if the preparation of teachers is to be adequate. Doubtless the failure to meet the needs in full is recognized quite generally by many, if not by all of the institutions devoted to teacher-training. To be aware of the failure will frequently be the means of increasing the opportunities that are needed.

A few representative opinions of principals and superintendents who have had actual experience in junior-high-school work will show that among this type of men there is a very strong demand for a most thorough training of teachers. The following quotations from recent letters written in reply to a request for an expression of opinion concerning the proper training of teachers for junior high schools will show the trend of thought among those who have most direct contact with the problem:

OPINIONS OF SCHOOL MEN

1. C. E. Chadsey, Superintendent of Schools, Detroit, Michigan: "At present we are demanding of these teachers the same training, both academic and professional, as is demanded of senior-high-school teachers. I do feel strongly that the standards for teaching in this group should be fully as high as those required for high-school teachers."

2. F. E. Clerk, Assistant Superintendent of Schools, Cleveland, Ohio: "In our attempts to organize a Junior High School in the city of Cleveland, we have given most of our attention to the problem of training teachers."

3. Martin L. Cox, Principal of The Robert Treat Junior High School, Newark, New Jersey: "Wisdom and prudence demand that the teachers of the new type school shall be of the skill, tact, and efficiency shown by teachers of

the upper grammar grades and shall also be of the advanced educational and scholastic attainments of teachers of senior high schools."

4. Philip W. L. Cox, Principal of the Ben Blewett Junior High School, St. Louis, Missouri: "Point I, then, is selection of human beings interested in city, state, national, and international problems, in books and pictures and sunsets, in athletics and plays, who like to sing and dance, to direct activities without getting into the limelight themselves.... General education, equivalent to a college bachelor's degree is desirable, and may the day arrive when it is feasible. Good methodology, actual practice in teaching under direction, is necessary in training teachers, of course."

5. C. H. Fullerton, Assistant Superintendent of Schools, Columbus, Ohio: "We expect soon to have none but college graduates doing junior-high-school work. I believe that is the proper ideal to be kept in mind."

6. Ben G. Graham, Principal of the Latimer Junior High School, Pittsburgh, Pennsylvania: "My experience goes to show that the teachers who have had successful work in the seventh and eighth years and have had professional preparation—at least graduated from a good School of Education—and better still having had a year of post-graduate work sufficient for an A. M. degree, make the ideal type for the Junior High School."

7. N. C. Hieronimus, Principal of the Garfield Junior High School, Richmond, Indiana: "No training can make a really successful junior-high-school teacher unless the individual to be trained has certain very definite natural qualifications, both physical and mental. Adolescents demand a vigorous physical and mental life of those who would lead; a breadth of interests as well as intensity; a sympathy *with* their life rather than *for* it."

8. C. F. Switzer, Principal of the Junior High School, Grand Rapids, Michigan: "The prime requisites of successful junior-high-school teachers are (1) successful teaching experience, (2) a genuinely sympathetic and helpful disposition, and (3) broad and thoro scholarship."

CONCLUSIONS

After this examination of theory and practice in relation to junior high schools, it is proper to offer a statement of conclusions. Obviously, it is possible to organize and to conduct junior high schools with poorly prepared teachers, just as it is possible to organize and to conduct any other kind of school with the same handicap. It is quite clear, however, that the demand for excellent teachers is stronger in the junior high school than in any other part of the public school system, on account of the needs of the children of junior-high-school age. To accept any standard of training except the best is to refuse to learn the lessons which the

failures in other parts of the school system should teach. There is no good reason for establishing a new type of school unless we can have teachers who are able to know and to solve the problems with which they must deal.

The conclusions may be summed up briefly as follows:

1. Select for junior-high-school teachers men and women who are young or who have the youthful spirit; who have broad human sympathies; and who understand and like boys and girls in their early adolescence.

2. Require of the persons who have the natural endowments enumerated in (1), a thoro academic education as represented by a four-year college course.

3. Require in addition adequate professional training. (In some cases successful teaching experience may be accepted in lieu of the professional training in a training school.)

If this program of training becomes the accepted standard in the country as a whole, the junior high school will be able to make a contribution to education commensurate with the expectations of its most enthusiastic advocates.

CHAPTER II

THE LESSON PLAN AND ITS VALUE TO THE STUDENT-TEACHER.

STEPHEN S. COLVIN

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In supervising the work of the cadet-teacher, I have emphasized the value of a carefully prepared lesson plan. Each student has been required to make out a daily plan in accordance with a definitely outlined form, which, however, is sufficiently flexible to suit itself to individual needs. The results on the whole have been thoroughly satisfactory. The details of this plan will be discussed later.

THE FUNCTION OF A LESSON PLAN

The lesson plan serves two important purposes. In the first place, it should give the student a comprehension of the main objectives which a subject or course of study seeks to realize. In the second place, it should furnish a working basis for the particular aims that the individual lesson is seeking to obtain. For this reason, I have found it profitable to discuss with the teachers at the beginning of their work some of the most important educational values. Hence I frequently ask a group of student-teachers such questions as these: "What in your opinion should be the purpose of education in a democracy?" "To make the pupil a good citizen, what specific things should the schools attempt to do?" "In attempting to make the pupil a worthy member of society, to what extent should the teacher consider the individual as such? How far should his interests, abilities, prejudices, social and economic

status, etc., in any way modify general aims and methods?" "Do the aims of secondary in any essential ways differ from those of elementary education?" "Do the specific things that the high school seeks to accomplish separate this grade of instruction from that of elementary instruction?"

Of course, these questions are to be considered as samples merely of many others that are asked. Their purpose is to cause the student-teachers to think about their teaching in relation to the scheme of education as a whole and to furnish them with a right attitude toward their work. It may be objected that in a practical course philosophical considerations have no place. And to this I would agree if such questions were merely philosophical—that is, if they issued in no practical consequences. It is, however, of the utmost importance that the teacher should have a broad and generous conception of his calling; that he should comprehend the relation of things; that he should have large objectives that extend his vision beyond the immediate work that he is doing, that give him an insight into its significance, and a means of evaluating its details in terms of something more comprehensive and important. This broad point of view is particularly necessary for the prospective high-school teacher, who often is content to teach his subject merely as a 'subject,' and whose greatest single fault is the 'hearing of lessons;' who all too frequently does not know where he is going, but simply that he is 'on his way.' For the elementary teacher, this broader outlook may not be as essential. Instructors in the lower grades are held down to very definite courses of study, to be taught according to carefully prescribed methods with definitely stated and measurable results. The high-school teacher, however, has large autonomy in many instances, and unless he has a stock of 'free ideas' to aid him, his aims in teaching, as well as his methods, are likely to be largely of the trial-and-error variety.

It must be emphasized, however, that the formulation of some of the more important objectives of education is merely one element, and by no means the most essential element, in the construction of an adequate lesson plan. The novice in teaching may have concluded that the chief purpose of educating the youth of a nation is to make them worthy members of a democracy; indeed, he may

have gone farther and decided that in order to accomplish this result there are certain fundamentals in knowledge, in skill, in useful habits, and in right ideals and prejudices that all must possess. He may see, too, that in the development of the child his individual capacities, needs, tastes, interests, and aspirations must be given increasing attention, since the individual is useful only in so far as he is capable and well-disposed. This alone will not help the teacher. The main objectives must be related to other less comprehensive ends and these must ultimately work themselves out in definite and concrete aims that are to be realized in the particular lesson that is to be taught. In other words, there must be a hierarchy of ends, from the most general to the most detailed, if a lesson plan is to be adequately constructed. The teacher, like every other doer of the world's work, is a hopeless idealist if he lives in the realm of these large values alone, if he does not try to make them function in the details of his daily task. While narrow aims without large objectives are blind, generous ideals without detailed ends that lead up to them are ineffectual.

THE RELATION OF GENERAL TO SPECIFIC AIMS

When the student-teacher has formulated some of the more general educational aims, he is asked to find the place that his subject has in the attainment of these aims. In other words, he is asked to evaluate his subject in relation to more general educational values. Such a formulation is made with relative ease for some subjects, while for others the difficulty is considerable.

For example, the teacher of history is guided in his choice of the materials of instruction, in the relative emphasis that he gives various topics, and in his methods of teaching, by considering history as an important means of training the pupil in the principles of good citizenship and community service. On various occasions, I have noted how such an ideal of the purpose of history has functioned to revise entirely the teaching of this subject, to vitalize it, and to give it point and interest.

Again, the teacher of literature frequently forms a new conception of his subject when he seeks as one of his chief aims to em-

phasize the fundamental moral lessons embodied in the works of great writers and to bring to the comprehension of his pupils the practical virtues that mean so much in right living and right thinking. Such a teacher is sure to spend less time on tedious and unprofitable details that all too often characterize the English instruction in our high schools, and more on those elements that make literature real to the pupil and genuinely human. When he has a broad and illuminating conception of his subject, he will hesitate to state that "the chief aim of the lesson is to get the pupils to tell accurately the story of Canto II," or "to drill the class in reading with clear enunciation." Such a teacher, too, is less likely to find his instruction in English dry and deadening both to himself and to his pupils—an experience which unfortunately is not uncommon, as many teachers have frankly confessed to me.

The teaching of science, likewise, takes on greater interest and worth when it is conceived in terms of its social significance and its value to the human race in its development. Its facts and principles can no longer be all of equal importance, since with this large objective in view they are weighed in terms of their human significance. The scientific ideal and the scientific method will then find their proper place in the lesson plan, and the history of science will not be entirely ignored. There will be less insistence on learning details merely as a memory cram, less formal and routine laboratory work, and a more obvious connection between the study and community interests. Few teachers who have made the effort to consider this subject in relation to fundamental educational values will openly state: "My chief aim in teaching this course in physics is to satisfy the college entrance requirements. All other aims I subordinate to this."

In the teaching of history, literature, and science, the value of arriving at broad educational aims and of relating these aims to the more detailed objectives of the subjects taught is easily seen by the average teacher; while the narrower practical values of the manual and the domestic arts at once place these subjects as a matter of course in direct relation to the higher aims of efficiency and community service. On the other hand, in the teaching of the languages and in the teaching of high-school mathematics, the higher

aims seem to throw but little light on the specific objectives to be achieved in these latter subjects. Of course, an exception is to be made in the teaching of English comprehension and English expression. Here it is evident that a mastery of current English as it is found in our newspapers, magazines, and books is a prime necessity for the realization of the most far-reaching and important educational aims, while ability to express one's self clearly and to the point is essential in communication with one's fellows.

In the teaching of a foreign language, however, the case is different. The teacher is often quite in the dark as to what the relation of Latin or French is to the pupil's ultimate career, while the pupil generally has no more definite reason for taking the subject than that it is required or it is essential for admission to some higher school. Sometimes the teacher seeks to find in the subject some distant cultural value or some disciplinary end, which, however, is for the most part unclear and uncertain. Such aims seldom serve to vitalize the teaching or to function helpfully in the lesson plan. At this point, however, it is desirable to emphasize the fact that the broadest aims of usefulness can never be realized in any subject unless that subject is mastered so that it can be used by the pupil. The teacher may be uncertain as to just what rôle the knowledge of a foreign language will play in the later life of the pupil, and how well it will serve him as an efficient member of society. This one fact is clear, however, that it can be of little value unless he has a sufficient mastery of it to employ it as an instrument in understanding, interpreting, and expressing the facts and ideas that it contains. Hence, the language should be taught with some definite and measurable objective in view. Latin is to be read and comprehended. French, further, may be taught in order that the pupil may write it and speak it. Such a conception at once suggests to the teacher a wealth of detailed aims and specific methods calculated to achieve the larger end of ultimate use of the language as a tool. One of the chief criticisms that at present can reasonably be brought against our teaching of foreign languages in the high school and the college is that years of study seldom achieve the end here set forth.

A similar problem is found in connection with the aims of high-

school mathematics. For the great majority of pupils the subject is of little practical use, and surely in part for the reason that the pupil has never mastered his algebra and geometry in such a way that they can be tools to serve him efficiently. At any rate, nothing is gained by the study if there is not a reasonable skill and mastery, not even the much exalted end of mental discipline. So the teacher's main objective in teaching this subject becomes clear: Teach those things that the pupil can master; teach them until they are mastered; and relate them as far as possible to the needs of the world in which the pupil lives.

OTHER CONSIDERATIONS THAT DETERMINE SPECIFIC AIMS

In determining the main aims of a subject of instruction, as well as the detailed objects of the day's lesson, the teacher needs to take into consideration something more than the larger educational values, as helpful as these are. I emphasize with my classes constantly the necessity of the teacher keeping in view the general and the specific abilities and interests of the pupils, the careers that may be open to them on completing their formal education, and the probability of their continuing courses of study for longer or shorter periods of time. Most of all, however, I emphasize the fundamental laws of learning as they relate themselves not only to methods of instruction, but to the aims of instruction as well.

It frequently happens, for example, that the general intelligence and the previous training of a group of pupils will decide whether it is possible to teach a subject with a large, or a relatively small objective in view. There are often in the same high school various divisions in the same subject, using the same textbook, and instructed by the same teacher. Frequently these divisions show marked differences in interest and ability. I have known some classes in history that respond eagerly to questions relating to political, social, and industrial problems, while others evince little interest in these matters, and are aroused only when history is presented as an interesting story with emphasis on its dramatic details. In other classes even this simple presentation fails to appeal to some individuals. Indeed, many pupils seem capable only of mastering a few important facts and in memorizing the text in a mechanical

way. It goes without saying that the teacher should attempt to conduct his course in terms of the largest aims possible; but if he finds that he has before him a particularly stupid and inert class, he should not attempt the impossible task of making a silk purse out of a sow's ear.

What is true of history is even more true of English, whether taught from the standpoint of expression or of comprehension and interpretation. As far as English expression is concerned, the teacher often finds himself in a peculiar difficulty. Pupils vary tremendously not only in ability, but also in previous training, with respect to the use of the mother tongue. The refinements and niceties of diction may be taught to one group of pupils, who, because of ability and home environment, possess large vocabularies, some sense of verbal differences, and a capacity to comprehend what good usage means. Another group of pupils may be ignorant of the meaning of the most common words, may have no appreciation for any of the elements of style, and may not be able to write simple sentences with uniform correctness. The greatest service that the teacher can do for this latter group in preparing them for efficient living is to ground them in the most fundamental things; to insist that they speak and write with some regard for simple grammatical principles, that they use words with reasonable accuracy, and that they spell the most common words correctly. More than this he cannot hope to accomplish for such a class.

In the work in composition, the teacher finds some pupils who possess a real sense for style and some inventive ability, and who may be, and should be taught to write well; but his aim for the majority must be to teach them how to express common thoughts in simple and direct ways. One pupil may be encouraged to write a poem or a story, while another is given the assignment of composing a business or a social letter in an acceptable form.

Literary appreciation and a comprehension of the great thoughts and ideals that the English classics contain may be brought home to some pupils in a more fundamental way than to others. The aim for all cannot be the same. "Exposing pupils" to good literature, advocated by Professor Snedden as a means of developing appreciation, cannot be practiced in an aimless and haphazard

manner. Different individuals require different treatment. Some pupils are immune to the best; they will get the literary fever, if at all, only by placing them in contact with books other than the great literary masterpieces, and only by emphasis on the part of the teacher of things that to him may seem of less literary value and less moral excellence. It is perhaps unnecessary to give further examples. In all subjects of the high-school curriculum, this maxim holds good: "Modify your aims with reference to the individual capacities and interests of your pupils."

The probable future career of the pupil must necessarily determine in a considerable measure what the particular aims of any course of study should be. Perhaps there is but one subject called English, but clearly certain aspects of it, to the exclusion of others, should be emphasized for pupils who are preparing for college. The emphasis will be different for those who are to use it in the commercial world. Technical pupils will require a technical vocabulary; they should be trained to express their ideas in direct and definite ways. Perhaps such a term as "Agricultural English" is not so gross as it at first seems, if the idea that the expression is intended to convey is comprehended. English is no more universal than any other discipline or study. It functions only in specific situations.

What is true of English is true of every subject in the curriculum. Physics cannot have the same aims when it is made a part of a course in general science as when it is taught as a separate subject to pupils preparing for college or a technical school. In the manual arts the main objectives are influenced by the question: "Are the pupils taking this course to acquire a general knowledge of, and some elementary skill in, hand-work, or are they seeking to become proficient in some definite trade?" Foreign languages vary their aims in terms of what use the pupil is expected to make of what he learns. Instruction in French often differs materially from instruction in Spanish, because the former is considered a cultural subject and the latter mainly a practical subject, to be taught chiefly to those who are preparing for positions in the commercial world.

The question as to whether a pupil will probably continue a

course of study for a period of years or pursue it only for a brief time has an important bearing on the objectives of the course. A one-year course in high-school mathematics must adopt different aims and pursue different methods from the older course, covering two years and a half. It is possible that some Latin may be taught to pupils who intend to study it for only one or two years, but surely the aims of such a course will be quite different from those set up for a course in which the pupil is to carry the subject for four years in the high school with a view of continuing it in college.

Such questions as the above I impress upon my students in connection with their lesson plans, but more than any of these considerations, I endeavor to emphasize the place that *the laws of learning* occupy in the general and in the detailed aims of instruction. Important among these laws in influencing the lesson plan are the four following:

1. *The elements that enter into the learning must be associated in their proper order.* This maxim concerns chiefly the method of instruction, but it also has an important bearing on the detailed aims that the teacher sets up, since there is a best possible order in learning.

In the study of a foreign language, should we emphasize grammar at the start, or make our objectives early in the course the acquisition of some ability in reading and speaking? Since the right order of learning involves beginning with those things that have interest, and are related to the pupil's experience, should the teacher in the manual arts have as his first aim the mastery of certain formal exercises, or the construction of some simple articles of every day use? Since the less difficult elements of learning should be introduced if possible before the more difficult aspects of the subject are taken up, should instruction in a foreign language have as its initial aim the mastery of phonetics? Should the conditional sentence, seldom found in the literature read by the first-year pupil of Latin, be treated during the period in which the learner is acquiring a knowledge of the elements, or should its consideration be postponed until the construction arises in actual use? Since fundamental habits of knowledge and skill must be acquired before the learner can proceed far in any subject, such questions as

these suggest themselves: "What facts in history should be made the subject of drill in the early stages of the course?" "What physical principles are most elementary in their nature?" "What are the most commonly used processes in algebra that must be early reduced to the level of mechanical skill?"

2. *Unnecessary elements should never be introduced in the learning with an idea that they may be eliminated later.* This maxim, for example, clearly enjoins the teacher of shorthand to avoid setting up as the aim of a lesson the study of outlines which cannot be economically used in actual practice. This principle will prevent also the teacher of a foreign language from emphasizing translation into English as an aim of instruction when the purpose of the course is to give the pupils facility in reading and understanding the text in the original.

3. *There are fixed limits to desirable and possible proficiency in any act of learning.* The teacher who understands this principle will not continue to hold up certain objectives when the pupil has reached the point where further improvement in specific elements of learning is either extremely difficult or without compensating results. Such a teacher will not insist on emphasizing with a class of beginners unusual constructions in a foreign language, or with the average pupil, ultra-fine distinctions in the use of the English words. He will not expect immature pupils to understand the intricate problems of constitutional law in the study of history, or require them to spell uncommon words without the use of a dictionary.

4. *Review of what has been learned is necessary. This cannot be haphazard. There is a sequence in review that is the most economical one.* I have found that this maxim is one of the most difficult for the novice in teaching to comprehend and apply in working out the daily lesson plan. Just how much of yesterday's lesson should be gone over again; what important matters taken up earlier in the course should be recalled at a later stage; what particular weaknesses of the class and of individual pupils need most of all to be corrected; what connection should be made between the review and the advance? These are questions constantly recurring

and demanding most careful attention in the formulation of the daily aims of instruction.

COMMON FAULTS MADE BY TEACHERS IN FORMULATING THE AIMS
OF THE LESSON

Up to the present point, the discussion may have given the impression that a consideration of the construction of the lesson plan, particularly of the nature and the function of the aim, precedes the drawing up of daily plans by the student-teacher. This is not so, however. The novice in teaching is given but a few preliminary instructions before he attempts to plan his work. A consideration of the lesson plan, not only in respect to the aim, but also in respect to its other essential features (to be discussed later), is carried on at the same time that plans are being drawn up and submitted, and the whole procedure is by the case method. In this way, theory and practice are kept in vital contact; the theory gives meaning to the practice, and the practice gives point and objective to the theory. Such a method of conducting the work I have found eminently satisfactory—a method which in my experience applies not only to the instruction of students in the art of plan-making, but to all teaching of whatever nature and whatever grade.

Student-teachers at first of necessity make many glaring mistakes in the formulation and utilization of aims, as well as in other details of the plan, and it is seldom before the middle of the scholastic year that reasonably good plans are submitted by the majority of the class. This, however, is to be expected. Gradually skill is obtained, and by the end of the year—during which some 180 lesson plans are handed in by most of the students (and in a few instances, double that number), and the lessons on which these plans are based actually taught—thoroughly good and practical plans are the rule.

The most common faults in determining the aims of the lesson that the novice in teaching makes are the following:

1. The detailed aims are vague and general, as for example:

“My aim in teaching this lesson is to make the class appreciate some of the best points in the story.” (Comment “What points?”)

“The aim for today is to review work touched upon during the last two

weeks.” (Comment: “You cannot cover all the things considered during this time. Ask yourself what points need to be most emphasized in review and why.”)

“In this lesson my aim is to discuss various difficulties that arise in connection with factoring.” (Comment: “State specifically what these difficulties are. Ask yourself how you decide what difficulties should be considered.”)

2. Not infrequently a broad aim, one which should enter in to determine the conduct of the entire course rather than the details of a single lesson, is set down as the specific aim for the day, as for example:

“My aim is to emphasize thought questions in discussing the political activities of the reign of Augustus.” (Comment: “You should plan to ask thought questions in practically every lesson you teach. What are the specific thought questions that you have in mind for today’s work?”)

“The aim of this lesson is to impress the class with the moral problems brought out in the play.” (Comment: “To emphasize the moral aspects of literature is one of the most general aims in teaching. What particular problems do you wish to bring out in the lesson? Be specific.”)

“My aim is to give the class some notion of the scientific method.” (Comment: “You have given a very large and important aim which should be before you in the teaching of the entire course. What specific things can you emphasize in your lesson in order that this large aim may be in part realized? You should select a few important details as the aims of your lesson, choosing these details in reference to your more comprehensive and general aim.”)

3. The detailed aims seem to have no relation to broader objectives, as for example:

“My aim today is to have the pupils look up in their dictionaries the derivation of the most unusual words they meet in their reading.” (Comment: “Why do you wish them to do this? How will a knowledge of the derivation of these words help the pupils in understanding and appreciating what they have read? Be sure that the time spent on this will justify itself in terms of the aims of the course before you adopt such lesson aims.”)

“My aim in teaching this lesson [in Macbeth] is to have the pupils form complete sentences in reply to the specific questions asked.” (Comment: “To what main aim that you have before you in teaching the plays of Shakespeare does this specific aim relate? This aim may have some justification, but have you no other and more important aim in teaching this lesson? Remember this is a class in literature, not in oral expression.”)

“My aim in today’s lesson is very specific. It is to teach the class the correct spelling of the following words found in the outside reading.” (A list of unusual words follows.) (Comment: “Does the teaching of the spelling

of these words help you in any way to realize the important objectives of this course? Remember that these words are so uncommon that probably not one of them will be used by your pupils in their written work either in school or out of school.'')

4. At the outset of the course, the student-teacher is likely to hand in aims that are purely formal in their nature, often being merely an outlined statement of the assignment, as for example:

"My aim is to call upon the pupils for the vocabulary and then to take up the translation of the sentences from Latin to English."

"My aim is to go over with the class yesterday's review and then to take up the advance propositions."

"My aim is to read with the class the two selections assigned them for the day."

In such instances as the foregoing, I point out to the individuals who submit these plans and to the class as a whole, the obvious fact that a mere formal statement of the lesson to be taught, as an aim in teaching has no value, since it cannot in any way determine details or methods. It does not function practically in guiding the teaching. On the other hand, I indicate that if the teacher carefully goes over the assignment and selects from many details definite points that he knows need emphasis, he has then given to his plan some point and value, particularly if he has chosen these details with reference to the larger aims of his teaching and the specific needs of his pupils.

5. Sometimes the teacher repeats the same aim day after day. When criticized for this, he frequently replies that he does not see how he can vary his aims. The same aim applies to all lessons, he maintains. This difficulty is most frequent in the teaching of the foreign languages, where the instructor is likely to proceed in a cut-and-dried way—so much vocabulary each day, so much translation from the foreign language into English, and so much composition in the language. To such teachers I try to make clear the fact that to have one unvarying object is to have no object at all. The teacher who aims at identical things from day to day, not considering the development of the work, the progress of the pupils, and some of the more ultimate values to be achieved, is in a hopeless rut of deadening routine.

6. Frequently student-teachers confuse aims and methods, substituting the *how* for the *what*, as for example:

“My aim in this lesson is to have the members of the class write out the advanced work on the blackboard, and then have it corrected by others.”
(Comment: “You are telling how you plan to do your work, not the objects you wish to accomplish. Ask yourself the question: ‘What results do I hope to accomplish by this method of teaching, and why is this the best way to accomplish these results?’ The results that you seek are your real lesson aims.”)

“My aim in this lesson is to conduct the work by question and answer.”
(Comment: “‘Question and answer’ describes a method of instruction, not an aim. What points do you seek to emphasize in your questions? These are your lesson aims.”)

“My aim in this lesson is to have the pupils recite on the various main topics. After each topic has been presented (but not during its presentation) the class will be allowed to ask questions of the pupil who has just recited.”
(Comment: “This describes a method and in some instances a helpful one. It does not tell what you aim to do by using this method.”)

7. The teacher at times sets up too many aims to be realized in any single lesson, although the aims considered singly may be excellent. Thus:

“My aim in this lesson is to consider first, the development of the story in the ‘Legend of Sleepy Hollow;’ second, to emphasize the exquisite humor of Washington Irving’s treatment; third, to discuss the epithets and descriptive adjectives that he employs; fourth, to analyze the character of Ichabod; fifth, to make the class realize the effects of foolish fears on the actions of an individual; and sixth, to lead the class to see that in this humorous narrative there is an element of pathos, making the application of this fact to life in general.”

8. Frequently the various aims are not mutually related and do not group themselves under a single higher aim to which they should contribute. To an extent the example quoted above suffers from this fault. The following even more obviously errs in this direction:

“The aim of this lesson is to give the boys practice in forming simple sentences in answer to questions; to make sure they all profited by the reading yesterday; to bring to their attention the principles of indirect discourse; also certain idioms explained under paragraph 154; further to stimulate interest in the subject; to impart knowledge about the country; and to improve pronunciation, reading ability, and vocabulary.”*

*Quoted from the writer’s *An Introduction to High-School Teaching*, p. 349.

THE METHOD AS A PART OF THE LESSON PLAN

The second important consideration in the lesson plan is the statement of the method by which the aims are to be realized. The chief characteristic of the effective method is that it should be adequate to realize these aims. Often, however, there is apparently little relation between the two, as the following example shows:

“The aim of the lesson is first to emphasize the importance of clearly relating a modifying clause to those parts of the sentence that it modifies; second, to consider with the class various varieties of modifying clauses; and third, to point out the most common errors made in the use of such clauses.

“Method: I shall devote the first part of the hour to a rapid review of yesterday’s advance. I shall then discuss the main points in the advance for today; and finally I shall take up with the class the sentences written on the board by various individuals.”

In sharp contrast with this obscure statement of method is the following in connection with a lesson, the subject of which is taxation as a cause of the French Revolution:

“Method: When the class assembles, I shall pass out sheets of paper for the purpose of having a short test. This test will require about fifteen minutes, and will be based upon the reading assigned to be done outside of the class. The following questions will be asked: (1) Give proofs that the burdens of taxation were unevenly distributed. (2) Name the different kinds of taxes in France at the time of the French Revolution. (3) What were the direct and indirect taxes? Explain and give examples of each.

“After the test is over, I shall begin the explanation of taxation by saying that the city of ———— has a yearly expense of about \$8,000,000. I shall then ask how this money is expended, so directing the questions that I shall receive such answers as the following: ‘To keep the city streets clean;’ ‘to pay the salaries of city officials;’ ‘to maintain the public schools;’ ‘to provide the enforcement of sanitary rules and regulations;’ ‘to maintain a fire department, and a police force.’ I shall then ask the question: ‘How does the city secure money to pay for these things?’ and I shall naturally expect the answer: ‘Through taxes.’ I shall then ask about methods of assessing taxes and securing their payment, and I shall compare such methods with those employed in France before the Revolution. I shall finally bring out through various questions the fact that the people of the city under discussion do not as a rule feel that taxation is a heavy burden, and that the poor are practically exempt from direct taxes. On the basis of these questions, I shall attempt to contrast the condition of the French people with those in the local community, and to show how excessive and burdensome taxation causes discontent and may ultimately lead to social revolution. In emphasizing this

last point, I shall call the attention of the class to the burdens of taxation that are being placed on the shoulders of the people of Europe in the Great War, and suggest possible results after the conclusion of peace.”*

The method, like the aim, is often too general to be of any specific value in realizing the concrete lesson aims. I frequently get statements of which the following are examples:

“My method will be by question and answer.” (Comment: “The question-and-answer method is, or should be, employed in the large majority of lessons taught. Your statement gives no idea of the details of method that you are to employ to realize the aims of this particular lesson.”)

“I shall use the development method for the most part in teaching today’s lesson.” (Comment similar to the preceding.)

“I shall spend most of the hour in demonstrating to the class the nature of magnetism.” (Comment: “Your statement is too general. Tell in detail how you plan to conduct your demonstration and how it is suited to bring to the minds of your pupils the aims that you have outlined above.”)

Again, the method, like the aim, is often stated in stereotyped form day after day, indicating no originality or adaptability on the part of the teacher.

As a rule, the novice in teaching gives too few details in his statement of method and is likely to ignore some of the most essential elements of the work in this statement. This is particularly true in regard to the main questions that he plans to ask and also in regard to the illustrations that he should use in his teaching. For this reason, I insist that all student-teachers shall include in their lesson plans, statements of the most important questions that they intend to put to the class and also of the detailed illustrations that they are to use in making clear the difficult and obscure parts of the lesson. I get a fair response to my first request, but in the majority of instances an unsatisfactory response to the second.

In regard to the framing of questions in advance of the lesson, I always meet the objection on the part of my students that it is extremely difficult to formulate questions prior to the actual class situation; that when such questions are formulated and held to rigorously, they give the lesson a stereotyped character and hold down the teacher to a cut-and-dried program, limiting spontaneity and hampering the free development of the lesson. To

*Quoted from the writer’s *An Introduction to High-School Teaching*, pp. 353, 354.

this objection (which in my mind is a real one, and which has a certain justification) I reply by pointing out that no details of a lesson plan should be adhered to with absolute rigor, particularly if there is a clear reason for modifying them in the course of a lesson, and that no teacher should be so much a slave to method, not even his own method, that he cannot depart from it in general or in details, if the occasion arises. A lesson plan, however, is in a small way similar to a plan of battle. The general in command must know his main objectives and his detailed aims; he must further have his method of reaching these objectives very clearly worked out in advance of the actual engagement. While many things may occur during the fighting to cause him to modify both aims and methods, the fact that he has planned what to do in advance will help him to change details intelligently. Further, certain main objectives must be realized if he is to win the engagement at all. It is equally true that while no teacher can foresee all the questions that he should ask in advance of the actual lesson, the teacher who goes into the class without a very definite idea of what his most important questions are to be and how they should be framed, is not likely to formulate them well on the spur of the moment.

In regard to the use of illustrations, I find most of the class in ignorance at the beginning of the course. I try to make the student understand: first, what the function of the illustration is; second, what the various types of illustrations are; and third, the general technique to be employed in their use. Space permits me to touch on these points only in a most general way. At the outset, I define an illustration as anything that makes clear something that is relatively remote, obscure, or abstract. I then point out to the class that the illustration may take various forms. The object or the process under consideration may be actually presented, or a picture or model of it may be used. Again, illustration may take the form of graphic representation. A means of illustration, particularly important in the teaching of literature and history, is to stimulate the class to call up in imagination incidents and scenes similar to those described in the text. Sometimes illustration is by analogy; sometimes it consists in a mere suggestion, the

last-named device being an excellent means of bringing moral situations to the attention of the pupils, and of enforcing ideals, as well as of illuminating elements of humor phrased in terms outside of the pupil's common experiences.

Naturally, student-teachers are able to select adequate illustrations more easily in some subjects than in others. The sciences offer the most obvious methods of illustration and demonstration, yet even here I find that students fall far short of their opportunities. Such subjects as language and mathematics give the chance to illustrate in the form of examples, though in a somewhat perfunctory and stereotyped fashion. In such cases, the problem is to find the best and clearest examples for bringing out the fact or procedure under consideration—by no means an easy thing to do. During the first weeks of the course, the student-teacher has little conception of methods of illustration by other means than those just mentioned. Graphic illustration in its various forms is generally a closed book to him; even the proper use of charts and maps is unfamiliar to him. He finds great difficulty in making his points clear through well-devised analogies, and he seldom appeals to the imagination of his pupils in making his treatment of history and literature the humanizing studies that they should be. As he goes on in his course, he improves in these particulars, but seldom achieves excellence during his period of practice-teaching.

OTHER FEATURES OF THE LESSON PLAN

Beside insisting* that my student-teachers formulate carefully their aims, and work out in reasonable detail the method by which these aims are to be achieved, I have found it advantageous to have them place at the end of each lesson the results that they believe they have obtained. Under the topic "*Results*" are included the general impression formed by the teacher as to how the lesson progressed as a whole, fairly detailed statements of those points where the results were excellent or satisfactory as well as of those which were relative failures, comparisons between the day's lesson and those that have preceded, statement of definite achievements of the pupils, frank comments on the aims set up, methods employed, questions asked, illustrations used, etc. When these results are

carefully and faithfully made out, they serve two excellent purposes. In the first place, they bring to the consciousness of the teacher in an impressive way just what occurred during the lesson. They aid the teacher in forming an estimate of the class. They are the means of honest self-examination and criticism. In the second place, they furnish a record of the daily work that can be referred to from time to time for comparison with later attainment. Student-teachers differ greatly in the emphasis that they place on the statement of results. Some content themselves with perfunctory and brief statements, such as: "Today's lesson went well on the whole. I had little trouble with attention or discipline." Other teachers write out in considerable detail what they consider was the outcome of the lesson, giving an interesting and intelligent analysis of their successes and failures, of the relative value of various parts of the lesson and a brief critique of their aims and method. The following is an example:

"I feel that to-day's lesson went better than any I have so far conducted. In the first place, the class was interested and alert. The reason for this attitude was, I am sure, that I tried to bring the discussion home to them, to relate it to their own experience and to the things that most concerned them. I am going to try to do this each day from now on. However, I must guard against two things. First, I must keep more to the subject, and not allow the class to wander far afield, however interesting the excursions may be. In one instance, I started in to discuss agrarian troubles in Italy and ended with the relation of high prices to the present gold supply. Second, I must prevent the individual members of the class from breaking in with comments and questions. Their interest prompts them to do it, but it creates a certain disorder that may affect the discipline. I had a feeling to-day that if I am not careful about this, I may soon have a disorderly class on my hands.

"In to-day's lesson I spent too much time on the advance and I had only five minutes for the assignment of tomorrow's work. I had planned for ten minutes, and I could have used even more to advantage. I think most of my questions were good, but too many were leading questions and involved little thought on the part of those who answered them. My illustrations 'went.' The class in every instance saw the point and were interested. I shall spend a good deal of time in the future in planning my illustrations. I wish I had better maps for part of this work, but I find I can get on by drawing rough outline maps on the board, and having the pupils fill in important details as they arise in the course of the recitation. I have not as yet overcome entirely the fault of asking questions twice or three times, or of repeating the answers of the pupils, but I am sure I am improving in this respect."

I require student-teachers to hand in their lesson plans at the end of each week. These are corrected and the main faults and merits are discussed with the class as a whole. The book in which the plans are written has space at the end for details other than those immediately connected with the plan. The student-teacher is required to give a written statement of the more important matters brought out during the week in his conference with his critic-teacher. He is asked to report all cases of discipline, their nature, the method of treating them and the results secured. He is also asked to give an account of individual help rendered pupils, stating the difficulty, the nature of the help given, and the outcome, as far as it can be judged. If he visits the class of another teacher, or observes the work of his critic in the conduct of a lesson, the student-teacher is asked to write out his impressions of this.

All lesson plans are required to be made out in advance of the lesson taught, and during the actual teaching are placed on the teacher's desk where they can be inspected by the critic-teacher or the supervisor of practice teaching. Changes made from this plan during the course of the recitation are indicated in red ink.

Student-teachers at times find the making out of lesson plans somewhat of a task, but on the whole their attitude is receptive, particularly after they understand the purpose of such plans and acquire some skill in constructing them. At the end of the year of practice teaching, each student is asked to write a paper commenting on the work, giving his impressions of its merits and defects. With scarcely an exception, the members of each class mention the planning of their lessons as one of the most helpful devices in their teaching. Doubtless they make this favorable comment in part because they know the instructor's attitude toward this phase of their work, but I am inclined to believe that there is a good deal of genuine approval in what they say. Many teachers who have past beyond the period of their novitiate, have told me in later years that while they no longer make out detailed plans for each day, they nevertheless continue to a considerable extent to plan their lessons, and find the practice of great value in their teaching.

In concluding this discussion, I append a lesson plan which

shows in some detail the main features touched on in the foregoing discussion. It is an example of one of the better plans submitted by a student-teacher toward the end of the year of practice teaching.*

LESSON PLAN IN PHYSICS

A. Materials Covered in the Lesson

(a) *Review.* I shall go over with the class the various facts previously discussed in regard to sound, namely,—that it originates in a vibrating body, that it is conducted through the atmosphere, and that it is in the form of longitudinal wave motion. What really travels through the air is a series of compressions, alternating with a series of rarefactions. (10 min.)

(b) *Advance.* Here we shall discuss the speed of sound, the graphic representation of sound, and the nature of the manometric flame. (17 min.)

(c) *Assignment.* I wish here to bring out the difference between noise and tone, and two of the three features by which tones are distinguished from one another; namely, loudness and pitch. I shall reserve the discussion of quality (fundamentals and overtones) for another lesson. (18 min.)

B. Outline of the Lesson in Detail

(a) *The aim.* The aim of this lesson is again to emphasize the physical facts relating to the cause of sound and its transmission; to draw a distinction between sound as a *sensation* and as a *physical phenomenon*; to frame with the class a definition of noise and tone, and of loudness and pitch. I shall treat these distinctions from two standpoints, sensation and physical energy. These latter distinctions will lead up to subsequent laboratory experiments.

(b) *Method.* I shall first ask a number of fact questions concerning matters brought out in previous lessons. Typical questions to be asked are as follows:

“If you clamp in a vise a blade of a hack saw, what must you then do to cause it to give forth a sound? As long as the sound continues what will you notice about the hack saw? Sound a tuning fork and notice that the edges look hazy. Why is this? What must we do to the strings of a mandolin in order that the instrument shall give forth a sound? What do the above facts show in regard to the cause of sound? The human voice is a good example of sound. Is the sound in this instance due to vibrations?” (This last question calls for discussion and reflection; it has not been touched on in previous lessons.) “How does sound travel from the source (vibrating body) to the ear that hears it? What proofs have you that it travels through the air? Does it take time to travel? What proofs have you that it takes time, and can you measure the time that it actually takes?”

*Quoted from the writer's *An Introduction to High-School Teaching*, pp. 418-421.

The above questions will emphasize the facts that sound is always caused by a vibrating body, and that it travels through the air. I shall next attempt to demonstrate the fact that sound travels in the form of waves. To do this, I shall use König's device, the manometric flame. (The nature of the sound wave has been discussed in previous lesson, but has not as yet been demonstrated, for the simple reason that the apparatus was out of order at the time the topic was first considered.)

I shall next draw on the board a graphic representation of sound waves and explain the construction of the graph.

In the assignment for tomorrow, I shall attempt first to lead the class to distinguish between two kinds of sound, noise, and tone, and to point out their essential differences first as sensations, and then as physical phenomena. To do this I shall use the various resources of the laboratory to produce sounds (both tones and noises). I shall strike the tuning forks, actuate strings, pound on the desk with a mallet, etc. By this means I hope to get a statement from the class that some of the sounds are musical and others are not. If I succeed in doing this, I shall then ask such questions (requiring reflection and thought) as the following:

"Give me a list of words (adjectives) that can be applied to tones; to noises." "Are tones always pleasant?" "Are noises always unpleasant?" "Are there some sounds that are both tones and noises?"

I shall next attempt to make clear to the class that the discussion of tone and noise which we have just had, considers sound as a *sensation*, not as a form of physical energy. I shall then ask what is the physical distinction between tone and noise, and shall again use the manometric flame with the purpose of showing that tone is due to a periodic motion, and that noise is due to a non-periodic motion.

By striking the tuning fork with gentle and hard blows, I shall attempt to lead the class to distinguish between loud and soft tones. By striking various forks I shall attempt to develop the notion of pitch. I shall clamp a clock spring in a vise, hoping to bring out the fact that as it is shortened it vibrates more rapidly and gives out a higher note. I shall also attempt to show that a vibrating string sounds loud when its amplitude is great, and soft when its amplitude is slight. Finally, I hope to lead the class to the conclusion that loudness is due to amplitude of vibration, while pitch depends on rapidity of vibration (frequency). In the next lesson (a laboratory exercise), I shall attempt further to prove these conclusions through individual observation and experimentation.

Questions asked. At the beginning of the hour the questions will be principally of the knowledge and the drill types; the majority of the questions will, however, be of the thought type. I shall aim to demonstrate and develop rather than to tell.

Illustrations used. I shall use numerous demonstrations as outlined above. In addition, in discussing the rate at which sound travels, I shall tell the class

about the explosion at Krakatoa in August, 1883, the effects of which were recorded at various points on the earth's surface. I shall illustrate compressions and rarefactions of the air by Mach's photograph of the stationary waves which accompany the flight of a Mauser rifle ball. I shall also refer to the effect of the explosion of ammunition in New York harbor in 1916. Glass windows were broken as far uptown as Times Square.

(c) *Results.* I attempted to cover too much in the hour. Some of the things I tried to do were too difficult for the class to comprehend, particularly the graphic representation of sound waves. This part of the lesson was a distinct failure. Some of my demonstrations did not come out well, particularly those connected with the manometric flame. Few of the class could see just what took place. I shall use this demonstration again as a laboratory exercise. The interest was on the whole well sustained. Some of the thought questions worked out satisfactorily. However, I was forced to tell a good deal that I had hoped to develop. On the whole, I should say that the lesson was fairly successful. Much must be gone over again in review.

CHAPTER III

THE TRAINING OF TEACHERS IN THE ACCREDITED HIGH SCHOOLS OF THE STATE OF WASHINGTON

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INTRODUCTION

There have appeared in the educational literature of the past decade or two many expressions of opinion of greater or less merit on what the character of the training of the high-school teacher should be. The Report of the Committee of Seventeen,* to which frequent reference will be made in this study, is, without doubt, one of the best, if not the best, of these. But we have had relatively few statements of what the actual training of any large group of high-school teachers has been. The authors, in common with others who have to do with the training of teachers for secondary schools, have been aware that, before any satisfactory program of reform in the training of high-school teachers can be carried into effect, we must have before us, among other things, the facts on the training of the teachers now in service in the state for whose high schools we are expected to prepare teachers. Pursuant to this felt need for a knowledge of conditions now obtaining in the high schools of the State of Washington, the writers, in the spring of 1917, launched an investigation designed to discover these conditions. The results of this investigation are here reported and, in order to enhance their significance, the facts assembled are presented in parallel with the statements of the Committee of Seventeen as to the kinds of training recommended by them. Although the investigation was initiated with the intent of obtaining facts that would be of use in helping to determine the preparation to be given high-school teach-

**Proc. Nat. Educ. Assoc.* 1907, pp. 523 ff.

ers-in-training in one state only and, in particular, for one higher institution in that state, in the early stages of assembling and interpreting the data gathered it became apparent that the outcomes were of more than merely local import, that they might even be typical, to a greater or less extent, of conditions in other states, and that, therefore, there was justification for securing for them more than merely local attention. It is on this account that the study has been prepared in its present form.

In order to obtain the facts required for the study, two questionnaires were sent out—one to the teachers in the accredited high schools of the State of Washington, asking them to report the actual preparation they had had for their work, and the other to the superintendents or principals who select and nominate the teachers, asking them to indicate the minimal amount of training such teachers should have in order adequately to meet the needs of the school systems under their supervision. The two questionnaires were alike in that they contained similar questions, asking for detailed information concerning the special academic training for the teaching subjects, the general academic training, and the professional (pedagogical) training.

In response to the questionnaires, returns were received from 496 teachers in the accredited high schools of Washington and from 39 superintendents or principals of such accredited schools. The 496 teachers were slightly less than a third of the total number of teachers in the accredited high schools of the state. In most cases the questionnaires had been carefully filled out and almost all were usable. Of these 496 returns from the teachers, 227 were from secondary schools in which there are 30 or more teachers, 123 from schools in which there are from 11 to 30 teachers, 146 from schools in which there are 10 teachers or fewer. Throughout this study these groups of teachers will be referred to as "teachers of Groups I, II and III," respectively. Most of the returns from the superintendents or principals were from the schools with the smaller instructional staffs, and, since the number of these replies is small, they were treated as a single group. Since the group contains but few principals, throughout this study we shall refer to the returns as the "superintendents'" returns or opinions.

In the discussion of the number of subjects taught and the recurrence of the different teaching combinations, the responses of teachers and superintendents used in this study are supplemented by the results of two investigations made available by the kindly co-operation of Dr. Frederick E. Bolton, Dean of the College of Education and Chairman of the Recommendations Committee of the University of Washington.

Our results will be presented and discussed under the following heads:

- I. Specific Academic Training in the Teaching Subjects
- II. General Academic Training
- III. Professional (Pedagogical) Training

I. SPECIALIZED TRAINING IN THE TEACHING SUBJECTS

When the Committee of Seventeen* in 1907 recommended as one of the components of the training of teachers for secondary schools "a detailed and specialized study of the subjects to be taught," they recommended what must call for the concurrence of all who are interested in securing effective high-school teaching. Without scholarship in the subject to be taught, a teacher must indeed be a blind leader. The facts assembled for the study here presented, however, indicate very clearly that for a large proportion of the teachers in the high schools of the State of Washington, this desideratum is not met. This is shown by the facts as to (1) *the number of different subjects that instructors are required to teach*, (2) *the actual numbers of academic hours of preparation which instructors have had for the subjects they are teaching*, and (3) *the chaos in the subject-combinations handled by the teachers*.

1. *The Number of Different Subjects Instructors are Required to Teach*

Table I indicates the numbers of different high-school subjects that were being taught or had been taught by the 496 teachers who responded to the inquiries concerning their work and training. This table is so constructed as to show the numbers and percentages

**Loc. cit.*

of each of the three groups of teachers who were teaching or had been teaching one subject, two subjects, etc. It is to be read as follows: 161, or 75.5 per cent., of the teachers in Group I (those teaching in the largest high schools) were teaching only one subject; 64, or 55.5 percent, of the teachers in Group II were teaching only one subject, etc. Before the reader proceeds to scrutinize the table fully, his attention should be called to the fact that for the purposes of this table and for the study in general, each one of the following has been regarded as a subject: English, Latin, general science, physical geography (and geology), botany, zoölogy, German, French, Spanish, mathematics, history (including civics), biology, physiology, chemistry, physics, agriculture, home economics, manual training, and commercial work (including economics). The significance of the table is to be seen by glancing down the columns of percentages for all of the three groups of teachers. While three fourths of the teachers in Group I were teaching only one subject, this proportion drops to a little over one half and less than one fourth, respectively, for Groups II and III, *i.e.*, for those teaching in the smaller high schools of the state. Correspondingly, while relatively small percentages of Group I were teaching two, three, and four subjects, the percentages of Groups II and III teaching these numbers of subjects were large. More than a fourth

TABLE I
NUMBER OF DIFFERENT SUBJECTS THE GROUPS OF TEACHERS ARE TEACHING
OR HAVE TAUGHT

Number of Different Subjects	Present						Past and Present					
	Group I		Group II		Group III		Group I		Group II		Group III	
	Times Reported	Per Cent. of Group	Times Reported	Per Cent. of Group	Times Reported	Per Cent. of Group	Times Reported	Per Cent. of Group	Times Reported	Per Cent. of Group	Times Reported	Per Cent. of Group
1	161	75.5	65	55.5	35	24.5	35	16.1	26	21.3	13	9.1
2	40	18.8	38	32.5	46	32.0	36	16.5	17	13.9	15	10.5
3	8	3.8	10	8.5	35	24.5	38	17.4	16	13.1	22	15.4
4	3	1.4	3	2.7	21	14.8	28	12.8	15	12.3	36	25.2
5	1	0.5	1	0.9	4	2.8	32	14.7	13	10.7	27	18.9
6	...	.....	0	.....	2	1.4	17	7.7	13	10.7	5	7.0
7	...	.....	...	.....	...	.....	11	5.0	10	8.2	14	9.8
8	...	.....	...	.....	...	.....	10	4.7	8	6.5	2	1.4
9	...	.....	...	.....	...	.....	3	1.4	2	1.6	3	2.1
10	...	.....	...	.....	...	.....	1	0.4	1	0.8	1	0.7
More than 10	...	.....	...	.....	...	.....	7	3.2	1	0.8	...	...
Total...	213	100.0	117	100.1	143	100.1	218	99.9	122	99.9	138	100.1

of the teachers who were serving the high schools with teaching staffs of ten teachers or fewer were handling three subjects and about a seventh were teaching four subjects. When we total the percentages of the teachers in each group who were carrying class-work in three or more subjects we find that they are 5.7, 12.1, and 43.5 per cent., respectively. Almost an eighth of those teachers in high schools having instructional staffs of eleven to thirty, and almost a half of those in high schools having staffs of ten or fewer are teaching three or more subjects! With these facts before us we may suspect that these teachers have not made a "detailed and specialized study of the subjects to be taught," especially since most of our institutions giving training to prospective high-school teachers make no pretensions to giving preparation in more than one or two subjects.

The grounds for this suspicion are considerably enlarged when one gives attention to the figures in the six right-hand columns of Table I. These columns present the numbers and percentages of teachers who have taught each of the several numbers of different subjects from one to ten or more. For the needs of this portion of the table, to the number of different high-school subjects being taught by each teacher at the time the inquiry was made were added the number of additional high-school subjects in which this teacher had given instruction during some earlier period of his experience. The first glance at the numbers and percentages in these columns, when compared with those in the six left-hand columns, discovers a marked drift toward the lower portions of the table. The proportions of these teachers in all three groups, who, in all their high-school teaching experience, have been privileged to teach one subject only are very small. Many in all three groups have taught three, four, five, six, and seven different subjects during their careers as high-school teachers. In fact, the total percentages in each of the groups who have taught from three to ten or more subjects are 67.3, 64.7, and 80.5, respectively—approximately two thirds of all teachers for the first two groups, and more than four fifths for the third.

What may have been a suspicion must, in the face of these facts, be strengthened to a conviction. Even though it be admitted

that many of these teachers have not had this experience in these additional subjects in the high schools which they are now serving, they have had it somewhere in the high schools of Washington or of some other state and the students in all these high schools must have been taught by teachers who have *not* made a "detailed and specialized study of the subjects to be taught."

Since the situation we have so far described is seen clearly to be more acute in the high school with the smaller instructional staff than for the high school with the larger staff, and since we must, in the nature of the case, be more concerned with the proper equipment of the teacher now in training than with the improvement in this regard of the teachers now in service in the high schools, it is pertinent to cite some facts drawn from a source other than that which supplies the main body of materials used in this study,—a source available through the co-operation of Dr. Frederick E. Bolton, Dean of the College of Education and Chairman of the Recommendations Committee of the University of Washington. This supplementary material concerns the 126 teachers placed in the high schools of Washington by this Committee for the school-year 1916-17. Table II and Chart I show the distribution of these teachers by the size of the instructional staffs of the high schools in which they were placed. One is struck by the fact that most of these teachers went to high schools employing 10 teachers or fewer. In fact, 81 per cent, or over four fifths, of the entire group

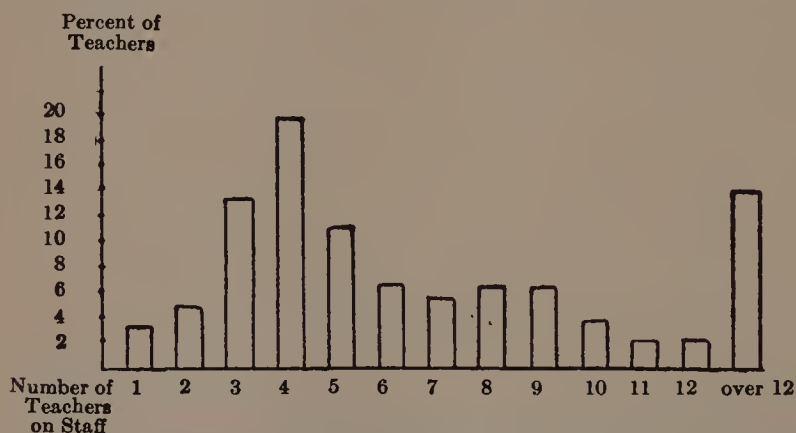


CHART I. Distribution by Size of Instructional Staff of High Schools in which 126 Teachers were Placed in 1916-17 by Recommendations Committee of the University of Washington.

TABLE II
SIZE OF INSTRUCTIONAL STAFF IN SECONDARY SCHOOLS IN WHICH 126 TEACHERS
WERE PLACED IN 1916-17

Number on Staff....	1	2	3	4	5	6	7	8	9	10	11	12	Over 12
Number Placed.....	4	6	17	25	14	8	7	8	8	5	3	3	16
Per Cent. Placed....	3.2	4.	13.5	19.8	11.1	6.4	5.5	6.4	6.4	3.9	2.4	2.4	14.3

went to high schools with staffs of this size, while 52.4 per cent., or more than half, went to high schools with 5 teachers or fewer.. This same group of appointees were asked to report the subjects which they were teaching in these high schools. The results of the assembly and classification of the responses of the 110 who answered this question are presented in Table III and Chart II. It may be

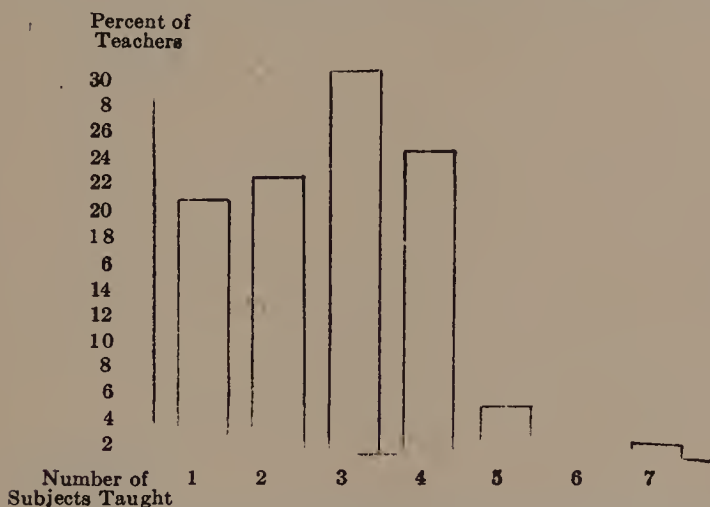


CHART II. Number of Different Secondary-School Subjects Taught by Teachers Placed in 1916-17.

TABLE III
NUMBER OF SECONDARY-SCHOOL SUBJECTS TAUGHT BY TEACHERS PLACED IN 1916-17

Number of Subjects	Number of Teachers	Per Cent. of Teachers
1	22	20.0
2	24	21.8
3	33	30.0
4	26	23.6
5	4	3.6
7	1	0.9
Totals.....	110	99.9

seen that only about two fifths of the entire group were fortunate enough to secure positions where they were limited to the teaching of one or two subjects, whereas the remaining three fifths were

teaching three to seven subjects—almost a third teaching three subjects; more than a fifth, four subjects; and no inconsiderable proportion as many as five subjects. We are forced to conclude that, in spite of the careful efforts of those in charge of the work of recommendation to place the candidates in positions for which their academic preparation best fits them, many must be attempting to give instruction in subjects for which they are inadequately equipped. As most of those placed by these committees having to do with appointments are recent graduates and as most of them go to small high schools, many of them to teach three or more subjects, it is obvious that training institutions have not yet solved the problem of providing a detailed and specialized knowledge of the subjects the teachers in training will be called upon to teach.

2. *The Subject-Combinations Taught by Instructors in the High Schools*

The detailed and specialized study of the subjects to be taught is rendered difficult not only by the number of different subjects handled by the teacher, but also quite decidedly by the chaotic combinations of these subjects which is readily revealed when one attempts to tabulate the reports. The mere number of different subjects in which teachers attempt to give instruction is appalling enough, but the great variety of subject-combinations is still more so. In Table I were shown the numbers of teachers teaching one subject, two subjects, three subjects, etc. The three tables now to follow describe the situation in greater detail.

Table IV presents the frequency of appearance of the subjects reported by those of the group of 473 high-school teachers making answer to this question who signified that they were giving instruction in a single line. It shows that by far the most common single subject taught is English, that its nearest competitor is mathematics, and closely following the latter in point of frequency are the three vocational lines, manual training, home economics, and commercial work. The only other subject appearing in this table more than a score of times is history. As is to be

TABLE IV
FREQUENCY OF APPEARANCE OF SUBJECTS REPORTED BY INSTRUCTORS TEACHING
ONLY ONE SUBJECT

Subject	Group I		Group II		Group III		Total of Groups I, II and III	
	Times Re-ported	Per Cent. of Group	Times Re-ported	Per Cent. of Group	Times Re-ported	Per Cent. of Group	Times Re-ported	Per Cent. of 473 Teachers
English.....	36	16.9	22	18.8	5	3.5	63	13.3
Latin.....	7	3.3	2	1.7	..	..	9	1.9
German.....	4	1.9	1	0.9	..	..	5	1.1
French.....	2	0.9	..	..	..	..	2	0.4
Spanish.....	6	2.8	..	..	..	..	6	1.3
Mathematics.....	22	10.3	8	6.8	6	4.2	36	7.6
History.....	17	7.9	3	2.5	2	1.4	22	4.7
Botany.....	2	0.9	0	0.0	..	..	2	0.4
Chemistry.....	4	1.9	1	0.9	..	..	5	1.1
Physics.....	6	2.9	1	0.9	..	..	7	4.5
Manual Training.....	12	5.6	11	9.4	7	4.9	30	6.3
Home Economics.....	17	7.9	7	6.0	6	4.2	30	6.3
Commercial Work.....	18	8.5	6	5.1	9	6.3	33	6.9
Physical Training.....	3	1.4	..	..	..	..	3	0.6
Miscellaneous Single Subjects.....	5	2.3	3	2.5	..	..	8	1.7
Totals.....	161	75.4	65	55.5	35	24.5	261	55.1

anticipated, most of these more commonly recurring single-subject positions are to be found in Group I. The exception is in the case of English in the high schools of Group II.

The numbers and percentages of such two-subject combinations as appear twice or oftener are shown in Table V. One is at once struck, on examining this table, with the very few times each of the combinations listed has been reported. English and history is the most frequently recurring two-subject combination, and it appears but four times in Group I, 13 times in Group III and 17 times in the entire group of 473 teachers.

Table VI gives further evidence of the same sort. Except for Group III, the proportion of non-recurring 2-subject combinations is greater than the proportion of recurring 2-subject combinations. Only 8 of a total of 52 3-subject combinations are recurring. These are not presented for the reader's inspection, but it may be stated that they represent three different combinations. All of the 4-subject and 5-or-more-subject combinations are of non-recurring sorts. If all the non-recurring combinations are totalled, they will number 147, and they constitute almost 70% of the total number of combinations reported. With a situation such as this obtaining, *i.e.*, with the almost total absence of combinations (excepting the 2-

TABLE V
NUMBERS AND PERCENTAGES OF RECURRING TWO-SUBJECT COMBINATIONS

Subject-Combinations	Group I		Group II		Group III		Total of Groups I, II and III	
	Times Re-reported	Per Cent. of Group	Times Re-reported	Per Cent. of Group	Times Re-reported	Per Cent. of Group	Times Re-reported	Per Cent. of Group
English and Latin	3	1.4	3	2.6	..	..	6	1.3
English and German.....	3	1.4	..	..	5	3.6	8	1.7
English and History.....	4	1.9	..	..	13	9.1	17	3.2
English and Mathematics.....	2	0.9	..	..	..	..	2	.4
English and Home Economics.....	..	..	..	..	3	2.1	3	.6
Latin and German.....	..	..	..	..	4	2.8	4	.8
Latin and Mathematics.....	..	..	2	1.7	..	..	2	.4
Latin and History.....	..	..	2	1.7	..	..	2	.4
German and Spanish.....	2	0.9	..	..	..	..	2	.4
French and Spanish.....	3	1.4	..	..	..	..	3	.6
Mathematics and Commercial Work.....	..	..	..	..	3	2.1	3	.6
Chemistry and Physics.....	..	..	2	1.7	..	..	2	.4
Chemistry and Home Economics.....	..	..	..	..	3	2.1	3	.6

TABLE VI
NUMBERS AND PERCENTAGES OF RECURRING AND NON-RECURRING TWO-, THREE-, FOUR-, AND FIVE-OR-MORE-SUBJECT COMBINATIONS

Combinations	Group I		Group II		Group III		Total of Groups I, II and III	
	Times Re-reported	Per Cent. of Group	Times Re-reported	Per Cent. of Group	Times Re-reported	Per Cent. of Group	Times Re-reported	Per Cent. of Group
Total Recurring 2-Subject Combinations....	17	7.9	9	7.6	31	21.7	57	12.0
Total Non-Recurring 2-Subject Combinations....	23	10.8	29	24.8	15	10.6	67	14.1
Total Recurring 3-Subject Combinations....	..	....	..	....	8	6.6	8	1.7
Total Non-Recurring 3-Subject Combinations....	8	3.8	10	8.6	27	18.9	45	9.6
Total 4-Subject Combinations (All Non-Recurring).....	3	1.4	3	2.6	21	14.7	27	6.7
Total 5-or-more-Subject Combination: (A non-Recurring).....	1	.6	1	.9	6	4.2	8	1.7
Totals.....	52	24.6	52	44.4	108	75.5	212	44.8

subject combination of English and history) that may be said to have become "standard" through crystallization out of practice, there can be little doubt that the chances that teachers will attempt to teach subjects for which they have too little detailed and specialized preparation are much enhanced.

Among the supplementary facts to which the writers have had access through the co-operation of Chairman Bolton of the

Recommendations Committee of the University of Washington are some bearing on the character of the calls for high-school teachers that came to the office of this committee during the school-year 1917. These calls came from a wider area than the State of Washington, so that such significance as they may have will at once be seen not to be purely local. Because a tabulation of these calls as to the number of subject-combinations they represent gives point to the condition we have just been describing, the main facts concerning them are presented in Table VII.

TABLE VII
CALLS FOR HIGH-SCHOOL TEACHERS RECEIVED BY THE RECOMMENDATIONS COMMITTEE OF THE UNIVERSITY OF WASHINGTON DURING 1917

Number of Subjects Named in the Calls.....	1	2	3	4	5	6	7
Number of Calls.....	229	374	270	171	71	34	8
Number of Different Combinations.....	...	140	206	116	54	28	8

Of the 1,157 calls here tabulated, 229 were for teachers of a single subject. The frequency of recurrence of these subjects appearing two or more times in the calls is given in Table VIII.

TABLE VIII
CALLS FOR TEACHERS OF SINGLE SUBJECTS RECEIVED BY THE RECOMMENDATIONS COMMITTEE OF THE UNIVERSITY OF WASHINGTON DURING 1917

Subject	Number of Calls	Subject	Number of Calls
Home Economics.....	66	Latin.....	5
Manual Training.....	50	German.....	4
Commercial Work.....	33	History.....	4
English.....	21	Spanish.....	3
Mathematics.....	12	Agriculture.....	3
Music.....	11	Botany.....	2
Athletics.....	9	Chemistry.....	2
		Total.....	223

The first five subjects in this list are identical with the five most frequently reported by those of the 473 teachers who are teaching but a single subject, as already reported, although the order of frequency is not the same in the two sets of data. Both sets of data seem to indicate that if one were desirous of teaching only a single subject in the high school, the chances of doing so are somewhat greater for these five subjects than for any of the remaining high-school subjects. The situation as to the variety of two-subject combinations in these calls does not seem to be quite as hopeless

as in the case of the material of the main portion of our study, but it seems to be not less so for combinations involving three or more subjects. It must be admitted in addition, as most of those who have had experience in submitting or receiving these calls are aware, that after the teachers have been appointed upon recommendation, they will in a rather large proportion of cases be finally assigned to combinations involving either different sets of subjects, more subjects, or both.

3. *The Number of Hours of Academic Preparation in Higher Institutions for the Subjects Taught*

We now turn to the facts concerning the number of semester-hours of preparation in higher institutions the teachers included in this study reported that they had had for the subjects they were teaching. A presentation of the situation in this regard is made in Table IX. This table indicates for each of the three groups and for each subject the number of teachers reporting, the numbers without preparation in the subject in higher institutions, and the first quartile, median, and third quartile in semester-hours of such preparation in higher institutions. A glance at the column of figures for the number of teachers reporting will show that the groups for the most part are large enough to assure findings that are fairly representative. Some indication of the state of affairs may be found in the numbers of each of the groups teaching each subject who report teaching that subject without preparation for it in higher institutions. While the proportions in Groups I and II who are teaching without such preparation are not particularly disturbing, we find cause for pause when we direct attention to the proportions in all subjects except German and general science for Group III (which includes those teaching in high schools with instructional staffs of ten or less): . The three right-hand columns of figures in this table, however, give us a better description of the semester-hours of work of collegiate grade the teachers had had for the subjects they were teaching, as they indicate the medians and the first and third quartiles of the numbers of semester-hours of preparation reported. The interpretation of these figures may

be illustrated as follows: a fourth of those who teach English in the high schools of Washington having instructional staffs of thirty or more (the group of largest high schools) have had less than 20.9 semester-hours of collegiate grade in this subject and the remaining three fourths, more; a fourth have had more than 44.8 hours; while

TABLE IX
SEMESTER-HOURS OF PREPARATION IN HIGHER INSTITUTIONS FOR SUBJECTS TAUGHT

	Number of Teachers Reporting	Number Without Preparation in Higher Institutions	First Quartile	Median	Third Quartile
ENGLISH					
Group I.....	41	1	20.9	36.3	44.8
Group II.....	33	1	17.7	23.7	39.4
Group III.....	40	3	11.0	25.0	40.7
LATIN					
Group I.....	14	0	20.8	35.0	43.1
Group II.....	14	0	17.5	32.5	46.3
Group III.....	26	7	4.6	8.8	32.5
GERMAN					
Group I.....	13	0	30.6	38.8	52.5
Group II.....	8	0	22.5	32.5	47.5
Group III.....	27	1	14.7	22.9	32.8
MATHEMATICS					
Group I.....	22	0	20.4	25.0	33.8
Group II.....	19	1	19.4	32.5	43.7
Group III.....	39	10	4.9	9.8	24.3
HISTORY					
Group I.....	27	1	16.2	24.3	41.6
Group II.....	15	2	7.2	12.5	28.1
Group III.....	44	7	6.3	9.8	21.7
GENERAL SCIENCE					
Group III.....	15	0	26.3	42.3	98.8
BOTANY					
Group I.....	7	0	9.4	21.2	41.3
Group II.....	5	0	...	22.5	...
Group III.....	14	3	5.8	11.7	18.8
CHEMISTRY...					
Group I.....	8	0	15.0	24.0	45.0
Group II.....	6	1	22.5	25.0	30.0
Group III.....	13	3	6.3	14.2	20.9
PHYSICS					
Group I.....	9	0	15.4	19.5	24.4
Group II.....	6	0	12.5	22.5	32.5
Group III.....	18	4	5.3	8.1	13.8
MANUAL TRAINING					
Group I.....	7	0	13.8	32.5	38.1
Group II.....	9	0	17.1	21.2	31.8
Group III.....	15	5	3.8	7.5	13.1
HOME ECONOMICS					
Group I.....	17	0	30.3	36.3	43.4
Group II.....	7	0	41.9	47.5	61.2
Group III.....	22	2	9.8	30.0	43.8

half of them have had less than 36.3 hours and a half have had more. The middle fifty per cent. have had between 20.9 and 44.8 hours of such preparation. When we compare with these figures the corresponding points for teachers of English in Group II, we find the latter uniformly lower. For Group III the first quartile is markedly lower than for the two preceding groups, while the median and third quartile do not differ notably from those for Group II. Examination of these points for the other subjects listed in this table will show that with a relatively small number of exceptions, as may be anticipated from the proportions of teachers in each of the three groups who were teaching three or more subjects, the number of hours of preparation drops off as we proceed from the first group to the third, and, also, that the decrease is usually much greater from the second group to the third than from the first to the second.

If it should be assumed that 12 to 15 semester-hours of work of collegiate grade is a 'teaching minor' in a subject and that this should be the minimum accepted for teaching high-school courses in the same subject—and few will contend that it is not low enough, while many will be ready to argue that it is far too low—our figures demonstrate all too clearly that there are many teachers of many subjects in many high schools who do not measure up to such a minimal standard. There are relatively few with less than such a minimum in Group I of the teachers in English and not many in Group II, but there are more in Group III. The situation in Latin is much the same as for English for Groups I and II, but emphatically more unsatisfactory for Group III, where more than half the teachers have had less than this assumed minimum. A first glance at the figures for the teachers of German seems to show a better preparation than for the two preceding subjects, but of this we cannot be certain, because we have no information as to the amount of work in German these teachers had had in high school before entering upon the work reported as taken in higher institutions. No doubt, there were many who were too meagerly equipped in scholarship in this modern foreign language to be able to give effective instruction in it. The situation in mathematics is very similar to that in Latin, the teachers of Group III being especially

poorly prepared. The subject in which teachers seem to be most poorly equipped academically is history, for even in Group I almost a fourth have had less than the assumed minor in the subject, while the preparation in Group II is almost as meager as for Group III. In the second group approximately half of the teachers have had less than this assumed minor, while more than half of the third group are similarly unprepared. As general science is a recent arrival among the list of high-school subjects, teachers of this subject were too small in number in Groups I and II to justify the computation of quartile and median points. It seemed appropriate to regard all work of collegiate grade in all sciences which the teachers of general science had pursued as preparation for teaching that subject. This has resulted in relatively high median and quartile points. When with this condition is coupled the fact that for one of these 15 teachers this preparation has touched eight different sciences, for five it has touched six, for four it has touched four, for four it has touched three, and for one only it has touched but a single subject, we have further evidence that their preparation in subject matter, as far as it concerns amount and range, is not far from satisfactory. In terms of quantity, many teachers of the special sciences of botany, chemistry, and physics, are poorly equipped, and this applies to the teachers in all three groups of high schools. The two remaining fields, manual training and home economics, offer a striking contrast in the matter of the adequacy of preparation in subject matter of those who teach them. Even in the high schools with the larger staffs, many teachers of the former subject have had little training in it; in the third group most of the teachers have had very little or no such training of collegiate grade. This absence may be compensated for to some extent in a few instances by the trade experience of some of the teachers, but it is all too plain that most of the teachers are wanting in higher training for their work. On the other hand, we have in home economics the subject that fares the best of all the subjects so far considered in point of preparation in subject matter of those who were teaching it. This preparation is more extended in Group II than in Group I, and although we find a considerable proportion of those in Group III with less than our assumed minor, the median

for this group is larger than that for the same group in any other subject excepting general science. Because the numbers of teachers involved are usually too small in one or more groups to justify including figures based on them in Table IX, facts concerning the preparation in subject matter of teachers of Spanish, physiography, commercial work, agriculture, and other subjects, have been omitted. In so far as the computations were at all trustworthy, they were indicative of the same general condition as obtains in the subjects for which figures have been presented and discussed. For example, too many teachers of physiography have had little or no preparation for teaching the subject. Teachers of commercial subjects seem to have received their training in subject matter in private business schools, most of them of not higher than secondary-school grade. This is, no doubt, in large part owing to the fact that our training institutions too infrequently give preparation for teaching this work. Agriculture, also, suffers from being taught by persons having had too little training in the subject in higher institutions.

Corroboratory evidence as to the small amount of preparation in subject matter of teachers in the high schools is to be found in Table X. This table shows the numbers and percentages of the 110 teachers placed in the high schools of the state of Washington by the Recommendations Committee of the University of Washington during the school year 1916-17 who report that they are teaching their major, first minor, second minor, and other subjects. The terms "first minor" and "second minor" as here used signify merely the subjects in which the teachers had had the second and third largest number of hours of work, *i.e.*, they do not in many cases signify a specific minimum number of hours of work. The amounts of work in many instances must be exceedingly small—too small indeed, to assure anything like minimal adequate preparation. Despite the great care used by the Recommendation Committee to place these teachers in positions as nearly suited to their preparation in subject matter as possible, only four fifths are teaching their major subjects, less than three fourths are teaching their first minors, almost a third are teaching subjects in which they have had as little work of collegiate grade as may be implied by the term "second minor," while almost half are teaching "other sub-

jects" in which they have had either little or no collegiate preparation.

TABLE X
NUMBERS AND PERCENTAGES OF TEACHERS PLACED IN 1916-17 IN THE HIGH SCHOOLS OF WASHINGTON BY THE RECOMMENDATION COMMITTEE OF THE UNIVERSITY OF WASHINGTON WHO ARE GIVING INSTRUCTION IN THEIR MAJOR, FIRST MINOR, SECOND MINOR, AND OTHER SUBJECTS

Teaching	Number	Per Cent
Major Subjects.....	88	80.0
First Minor Subjects.....	79	72.8
Second Minor Subject.....	35	31.8
Other Subjects.....	50	45.4
Total.....	110	

Of those who have been aware for many years of the inadequacy of preparation in subject matter of a large proportion of the teachers in our high schools, many have been accustomed to lay the blame for it at the door of the superintendents or other officers having to do with the selection and nomination of candidates to teaching positions in the high school under their supervision. It

TABLE XI
SEMESTER-HOURS OF PREPARATION IN HIGHER INSTITUTIONS DESIRED FOR TEACHERS OF CERTAIN HIGH-SCHOOL SUBJECTS BY THE SUPERINTENDENTS

Subjects	English	Latin	Modern Foreign Language	Mathematics	History	Botany	Chemistry	Physics	Manual Training	Home Economics
Number of Opinions.....	39	35	29	39	39	34	37	39	37	37
Range.....	6-76	0-40	4-50	4-52	4-66	4-48	4-40	2-44	4-80	4-76
First Quartile.....	22.8	7.7	17.1	11.3	22.7	12.1	17.3	11.9	21.6	22.8
Median.....	32.1	14.9	31.5	22.5	37.5	21.2	25.6	18.9	34.5	41.8
Third Quartile....	42.3	23.0	41.5	32.8	45.6	28.1	32.7	26.5	44.8	50.9

was thought proper by the writers to include as a part of this investigation a study of the opinions of these officers as to the "minimum total number of hours of work of college grade in the special subjects" they would consider adequate for preparation for teaching the courses in those subjects in their high schools. Thirty-nine superintendents and principals were kind enough to make usable responses to a rather extended questionnaire which in part inquired into their conception of minimal preparation in subject matter desirable to teach each of the following subjects:

English, Latin, modern foreign languages, mathematics, history, botany, chemistry, physics, manual training, and home economics. This list of subjects is identical with that for which figures have been presented in Table IX, except that in the former modern foreign languages was substituted for German and that general science was omitted. The numbers of opinions secured, the range in semester-hours of such preparation desired, the medians, and the first and third quartiles have been introduced into Table XI. As our interest in this connection centers mainly in a comparison of these opinions and the actual figures for preparation which we have just presented and discussed, the reader will find it profitable to examine Chart III which essays a comparison of the medians for Group III of Table IX and the medians of Table XI. The justification for the use of medians of Group III in the comparison will be seen when it is stated that 30 of the total of 39 nominating officers who ventured opinions were superintendents of the high schools of Group III, less than a fourth of the responses coming from nominating officers concerned with the high schools of Groups I and II. It may be seen from this chart that the medians of the nominating officers' desires exceed in every instance—almost in every instance *far* exceed—the corresponding medians of the actual preparation of the teachers in the high schools. In fact, if the reader will compare the medians of Table XI with those for both Groups I and II in Table IX, he will note that in four instances the former appreciably exceed the latter in amount, in twelve instances they approximate them, and in four instances only do they fall appreciably short of them. These four instances are to be found in the medians for Latin (two instances), modern foreign languages in comparison with German (one instance), and mathematics (one instance). Partial explanation of the marked disparity for Latin is to be found in the fact that the questionnaire to the nominating officers stated clearly that their answers were to assume four years of Latin of high-school grade preliminary to the work of college grade in the subject and in the fact that the nominating officers—most of them, as already indicated, answering for high schools of Group III—were thinking mainly of preparation for teaching the subject in their high schools, many of which

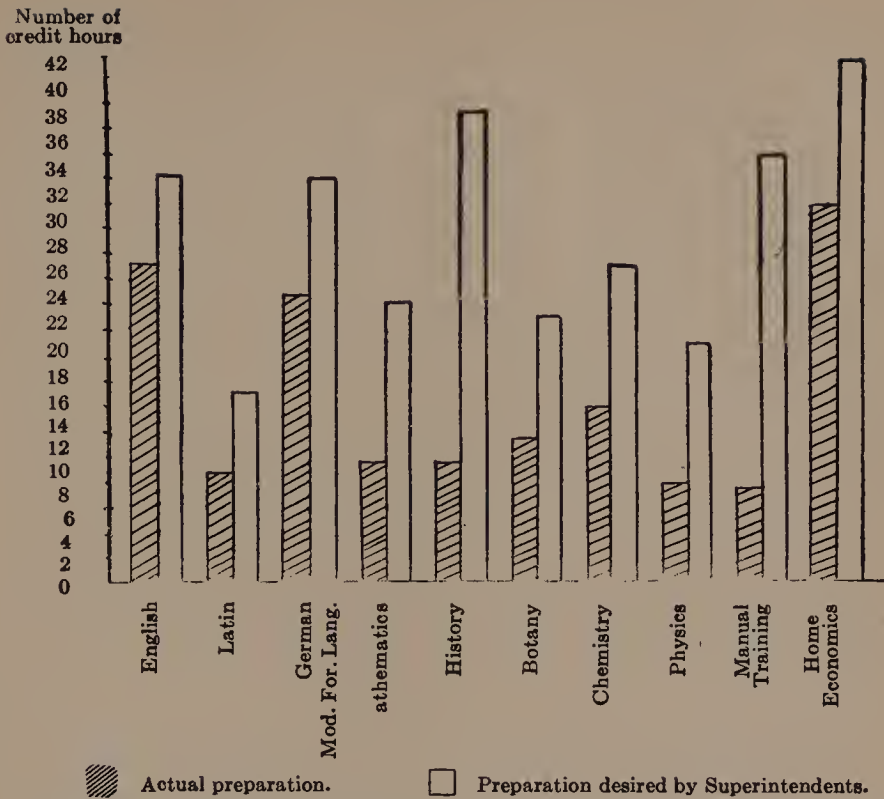


CHART III. Median Number of Hours of Actual Preparation of Teachers of Group III and the Median Number of Hours Desired by Superintendents.

do not offer work beyond Caesar. Because the figures for German have not given consideration to the amount of work the teachers had had in high school in that subject and because the figures for modern languages assume *no* work in the language in high school, their respective medians are not safely comparable. Nor, because the opinions assume but two years of high-school mathematics antecedent to the mathematics to be taken in the higher institutions and because the teachers answering the questionnaire on training were not asked to state the number of years of high-school mathematics they had had previous to their college work—although they all or nearly all must have had two or more years of such high-school work—the medians in this instance are hardly satisfactory for dependable comparisons. The evidence in this portion of the

study seems to indicate that the charge frequently preferred against the secondary-school administrative officer, that preparation of the teacher in subject matter seems to him to be of little consequence, is far from generally true. *He desires more of such preparation on the part of his teachers than he can get. This is especially true where the instructional staff of the small high school is concerned.* Thus, in the endeavor to secure teachers better prepared in subject matter, it is unnecessary to urge this need upon those who nominate teachers; the solution of the difficulty is to be sought in other ways.

Since it has been shown, on the one hand, that the teachers actually have little preparation in the subjects they are teaching and, on the other hand, that superintendents desire teachers with much more extended special preparation for the subjects taught than they have actually had, one may at this juncture hastily conclude that a very large proportion of these teachers are still undergraduates and that, for the most part, they have had periods of training in higher institutions too brief to permit them to receive

TABLE XII
NUMBERS AND PERCENTAGES OF TEACHERS WHO HAVE ADVANCED DEGREES,
BACHELORS' DEGREES, AND WHO ARE UNDERGRADUATES

Academic Classification	Group I		Group II		Group III		Groups I, II, and III	
	Num- ber	Per Cent.	Num- ber	Per Cent.	Num- ber	Per Cent.	Num- ber	Per Cent.
Advanced Degrees.....	43	18.9	18	14.6	10	6.8	71	14.3
Bachelors' Degrees.....	147	64.8	86	69.9	105	71.9	338	68.1
Undergraduates.....	34	14.9	18	14.6	31	21.2	83	16.8
No Answer.....	3	1.3	1	.9	...	....	4	.9
Total.....	227	90.9	123	100.0	146	99.9	496	100.0

sufficient training. However, a glance at Table XII reveals the fact that more than four-fifths of all the 496 teachers hold advanced or bachelor's degrees and that only 17 per cent. of all these teachers would be classed as undergraduates. The proportions of each classification do not vary markedly from group to group. This wholesome situation results from careful enforcement of a policy pursued through several years by the State Board of Education and the State High-School Inspector. It may be added that in all the groups, but more especially in Groups I and II, many of the undergraduates are teachers of the special subjects, such as manual training, the commercial branches, or music,—subjects for the

teaching of which preparatory training has not yet been provided in our higher institutions. While most educators would urge that teachers in accredited high schools should be college graduates, it may be conceded that 17 per cent. of undergraduates must have no great total influence on the problem under consideration. Such influence as it has, must be more than offset by the influence of those who have done work toward advanced degrees. Table XII shows that but 14.3 per cent. of all teachers have advanced degrees, but it should be added that 39.7 per cent. of all teachers (48.4, 39.0, and 26.7 per cent. in Groups I, II, and III, respectively) have done some graduate work. Thus, we must cast aside the assumption that the exceedingly meager training which teachers have had for their teaching subjects is attributable to a relatively low academic standing and short period of training.

4. Conclusions and Recommendations on Special Academic Training in the Subjects Taught

(1) The one outstanding finding of the portion of our study so far presented is, that the teachers in the accredited high schools of the State of Washington, especially in those high schools with the smaller instructional staffs, have all too frequently had a very meager preparation in higher institutions in the secondary-school subjects in which they are giving instruction. The cause of this unfortunate lack of preparation is in large part the number of different subjects that instructors in the high schools are required to teach and the corresponding fact that our institutions for the training of high-school teachers rather commonly aim to give them academic preparation for teaching only one or two subjects. A contributory factor of much importance must also be the chaos in the subject-combinations in which teachers were found to be giving instruction, a chaos that almost precludes any appreciable extent of recurrence of combinations. Additional facts that have been presented tend to absolve superintendents from guilt in the matter of wilfully ignoring the importance of training in the subjects to be taught, as their desires in this regard are seen generally to exceed the preparation the members of their high-school staffs report that they have had. Nor, inasmuch as a rather small pro-

portion of the teachers reporting for this study are without bachelors' degrees, is this situation to be accounted for to any considerable extent by the limited period of training of these teachers in higher institutions. On the contrary, there are almost as many who had some graduate training as there are who are still of undergraduate standing.

(2) Turning now to the recommendations looking to the improvement of the unsatisfactory condition this study has discovered in the special preparation of teachers for the subjects taught, we are prompted to say in the first place, that, in so far as the condition found is attributable to the short period of training in higher institutions of some teachers, those in authority, viz., state boards of education and high-school inspectors, in approving teachers for accredited high schools should continue in the present policy of insisting upon the bachelor's degree or its equivalent as the minimum of preparation for such teachers. This is the minimal standard set by the Committee of Seventeen, by voluntary standardizing agencies, *e.g.*, the North Central Association of Colleges and Secondary Schools, and by many states. One state at least, viz., California, insists upon an additional year of training, and the tendency in the future in other states will inevitably be in this direction.

(3) As long as the higher institutions presuming to provide training for prospective high-school teachers neglect to give an adequate amount of special training in subject matter in certain recognized high-school subjects, so long must we have teachers poorly prepared for teaching those subjects. Two subjects in which this study has found teachers inadequately prepared are manual training and the commercial branches. It is well known that little or no preparation for teaching these special subjects is given in most of our higher institutions that make pretensions to training high-school teachers. Every one is aware of the type of institution to which those giving instruction in these subjects in the high school have frequently had to turn for such preparation as they have had. If the entire range of secondary-school subjects had been investigated in this study, other subjects would, without doubt, have been found for the preparation for the teaching of which our

higher institutions are doing little or nothing. Here, certainly, is a clearly defined line along which progress may and should be made.

(4) Another very obvious recommendation urged by the facts of this study is that our institutions having to do with the training of high-school teachers must train each of them to give instruction not in *a subject*, but rather in *subjects*. Knowing, as we do, that almost all the product of these training institutions go first to the traditionally organized smaller four-year high schools with the smaller instructional staffs, we must prepare them to give instruction not merely in one or two, but most often in not fewer than three subjects. Some institutions have already been doing this for a number of years, but too many still proceed in ignorance, neglect or even defiance of the lessons of such facts as have been cited in the present section of this report by requiring such a large number of credit-hours in one major subject as to preclude the students' making any considerable preparation for teaching other subjects.

(5) But merely giving each prospective high-school teacher special academic preparation in as many as three different high-school subjects will not go far toward a solution of the problem with which we are here concerned. With the chaos in subject-combinations now being assigned to teachers in our high schools there is little likelihood that, if a teacher-in-training makes preparation in any two or three different subjects, he will be fortunate enough to be permitted to teach those same two or three subjects in the high school to which he goes when his period of training is concluded. One need have no profound knowledge of mathematics to be aware of the multiplicity of two-subject and three-subject combinations possible with all the subjects of study now being taught in our high schools. If no effort is to be made to train teachers in what we may term *standard combinations*, or, after training them, to elect them to teach the combinations in which they have been prepared, little hope of improvement of the situation may be entertained. It does not seem to the writers impossible to establish such standard combinations, even though the presentation of the facts of this study has discovered little tendency toward such standardization out of current practice. But to attempt such standardiza-

tion of combinations for a single state does not appear feasible, because of the large number of institutions and wide range of territory from which the high-school teachers of any state are recruited. This may be illustrated by a fact not yet cited in this study but deserving serious attention—that the 496 high-school teachers with which this study mainly deals have received their training in 183 different higher institutions located in 28 different states. With the high-school teachers of a state coming to it from almost two hundred institutions in more than half the states of the union, the standardization of subject-combinations becomes a problem of inter-state and nation-wide significance. Therefore, the writers would urge that voluntary agencies operating over wide areas undertake the task of designating standard combinations. Such bodies as the National Education Association, the Association of College Teachers of Education, and the North Central Association of Colleges and Secondary Schools could perform a service of inestimable value for secondary schools by first making a study of subject-combinations recurring in wide areas and then making recommendations in the direction of standardization. With such facts and such recommendations before them state authorities could insist upon the preparation of prospective teachers for giving instruction in these standard combinations, and colleges and universities would have a better basis than they now possess on which to give vocational guidance to such prospective teachers. Those having to do with the appointment of high-school teachers—boards of education, superintendents, and principals—should also in time be required to select teachers prepared to give instruction in the standard combinations. Such standardization of combinations recommends itself to the writers as one of the most fruitful suggestions evolving from the present study.

(6) The facts so far presented constitute one of the weightiest arguments for the reorganization of secondary education in the smaller communities on some such plan as the six-six or six-three-three. It must be manifest to all those who have given this matter serious consideration that, as long as we have four-year high schools whose entire curricular offerings must be presented by two, three, or four teachers, so long must we have a large proportion of teach-

ers attempting to give instruction in subjects for which they have had insufficient preparation. This will be true despite our best efforts to standardize combinations as suggested in the preceding paragraph. A desirable extent of departmentalization is almost always an impossibility under such conditions. It must be even more manifest that the extension of the high-school organization down into the seventh and eighth grades in these smaller communities, thus providing a six-year secondary-school program, will make this desirable extent of departmentalization much more nearly realizable and will at the same time hasten the carrying into operation of the standardization of combinations already discussed. The benefits of such reorganization are already being demonstrated in the school systems of these smaller communities still traditionally organized, *i.e.*, on the eight-four plan, where teachers of home economics give instruction in their subjects both in the high school and in the upper grades. Because they are thus already assigned to a full teaching schedule, very frequently these teachers are not called upon to give instruction in subjects outside their special fields. The same situation obtains for teachers of manual training in many smaller communities. The reorganization suggested will carry a larger measure of such departmentalization than is now possible to other subjects of study. For example, the teacher giving instruction in English will be responsible for five or six years of work in that subject and will not, therefore, be required to give instruction in a number of additional subjects. The teacher giving instruction in mathematics will be responsible for four or five years of work in that subject and will, similarly, not be required to give instruction in as many additional subjects as under present conditions. Analogous advantages for the teaching of other subjects will at once occur to the reader, which, with those here used as illustrations, should convince him that reorganization of secondary education in the smaller communities will go far toward remedying the unsatisfactory condition to which attention has been directed in the present section of this study.

(7) Finally, our facts constitute an additional protest against the needless multiplication of very small high schools. Such high schools mean very small instructional staffs and these in turn

mean the giving of instruction in subjects for which the teachers are all too inadequately prepared. It must be admitted, of course, that under pioneer conditions in new states it may be advisable temporarily to encourage the provision of high-school work in small communities that are remote from the larger population centers where effective high-school instruction may be given. But for the legislative and educational authorities of a state to enact and carry out a policy of encouraging the multiplication of small and feeble institutions in disregard of proximity to population centers or of other conditions making for effective high-school work would be nothing less than the encouragement of an inefficient school system.

II. GENERAL ACADEMIC TRAINING OF THE HIGH-SCHOOL TEACHER

The Committee of Seventeen recommended not only "a detailed and specialized study of the subjects to be taught" as a component of the training of teachers for work in secondary schools, but they recommended also (a) that "the program of studies selected by each student should include work in subjects outside of those in which he is making special preparation, sufficient to give some insight into the different fields of knowledge and to avoid the dangers of over-specialization," and (b) that it should contain also "one or more subjects from a group" including history, economics and sociology, and, in addition, "a course in general psychology and at least one from a group of subjects including the history of philosophy, ethics, and logic." The Committee recommended the work in the social studies in order that the student might be given the "social outlook," while the work in the group last named should be required to give an outlook upon education as the development of the individual. They are thus seen to have deemed it necessary to ballast the detailed and specialized training in the subjects to be taught by what we may term "general academic training" which should give some insight into, and appreciation of the different fields of knowledge and which should also generate proper attitudes and points of view.

1. General Academic Preparation of Teachers in the High Schools of Washington

The facts presented in Table XIII describe the general academic training of the group of teachers under consideration. This table indicates merely the numbers and percentages of teachers in each group who have studied a particular subject in a higher institution. For the purposes of this table differences in the total number of hours a teacher may have had in a subject are disregarded, the *presence only* of the subject in the teachers' preparation being considered the point of interest. It thus represents an attempt to ascertain the breadth and scope of the teachers' preparation, in contra-distinction to the special training discussed in the preceding section of this study. A glance at the right-hand columns of the

TABLE XIII

THE NUMBERS AND PERCENTAGES OF TEACHERS WHO HAVE HAD PREPARATION IN HIGHER INSTITUTIONS IN THE DIFFERENT SUBJECTS AND SUBJECT-GROUPS

Subject or Subject Group	Group I		Group II		Group III		Total of Groups I, II, and III	
	Number	Per Cent. of Group	Number	Per Cent. of Group	Number	Per Cent. of Group	Number	Per Cent. of Group
English.....	202	92.2	120	99.0	139	95.1	461	95.2
Mathematics.....	181	82.6	118	97.5	123	85.4	422	87.2
Latin.....	125	57.1	78	64.4	63	43.7	266	54.9
Greek.....	54	24.6	28	23.1	30	20.8	112	23.1
German.....	161	73.5	81	66.9	101	70.1	343	70.8
French.....	121	55.2	60	49.5	49	34.0	230	47.5
Spanish.....	36	16.4	13	10.7	11	7.6	60	12.4
History.....	185	84.5	104	85.9	122	84.7	411	84.9
Political Science and Sociology.....	149	68.0	85	70.2	109	75.7	343	70.8
Chemistry.....	118	53.8	71	58.6	82	56.9	271	55.9
Physics.....	97	44.3	66	54.5	62	43.1	225	46.5
Botany.....	105	47.9	64	52.9	70	48.6	239	49.4
Zoology.....	87	39.7	50	41.3	53	36.8	190	37.2
Physiography and Geology.....	94	42.9	51	42.5	58	40.3	203	41.7
Astronomy.....	47	21.4	34	28.1	22	15.3	103	21.3
Agriculture.....	13	5.9	17	14.1	27	18.8	57	11.8
Physiology.....	70	31.9	39	32.2	46	31.9	155	32.0
Philosophy and Ethics..	139	63.4	67	57.8	81	56.0	287	58.9
Public Speaking.....	86	39.2	45	37.2	66	45.8	197	40.7
Home Economics.....	23	10.5	17	14.1	30	20.8	70	14.4
Manual Training and Mechanical Drawing..	37	16.9	28	23.1	29	20.1	94	19.4
Music.....	56	25.6	40	33.1	47	34.0	143	29.5
Graphic Arts.....	20	9.1	14	11.5	23	15.8	57	11.8
Commercial.....	26	11.9	11	9.1	26	18.1	63	13.0
Some Foreign Language.	195	93.6	111	91.7	125	86.8	431	86.9
Some Ancient Language.	124	56.6	68	56.2	68	40.3	260	53.7
Some Modern Foreign Language.....	179	81.7	99	81.3	119	82.6	397	82.0
Some Social Study.....	200	91.3	112	92.5	134	93.1	446	92.1
Some Science.....	192	87.6	109	90.1	132	91.6	433	89.4

upper portion of this table will show that 95.2 per cent.—almost all—of the teachers have had courses in English in higher institutions, while more than four fifths have had courses in mathematics and history. German, political science, economics and sociology have been studied by about 70 per cent., philosophy and ethics by 60 per cent.; while Latin, French, chemistry, physics, botany, physiography and geology, and public speaking have been studied by about one half. The remaining subjects listed range from 11.8 per cent. for agriculture and the graphic arts to 37.2 per cent. in zoölogy. If we compare the proportions for the different groups, we note, as we proceed from Group I to Group III, a decreasing percentage of teachers who report having had work in the foreign languages. In connection with the languages, it is pertinent to note that twice as many teachers have taken courses in the modern foreign languages as in the ancient languages. In the sciences the percentages are roughly constant as we pass from group to group. Although approximately equal numbers of teachers have had work in each of the different sciences, chemistry was reported by the highest percentage of teachers, with botany, physics, physiography and geology, and zoölogy following in the order named. We find increasing percentages of the teachers reporting the newer subjects, such as agriculture, home economics, manual training and mechanical drawing as we proceed from Group I to Group III. This is probably due to the fact that the teachers in Group I received their training earlier than did the teachers of Groups II and III and that these subjects were not as well established at that time as they have been in recent years.

The lower portion of the same table presents a grouping of certain subjects listed in the upper portion with the aim of showing the proportions of the teachers who have had some work in each of these large groups. This attempt at summary shows that of all the teachers under consideration, 86.9 per cent. have had some work in higher institutions in foreign language; 92.1 per cent., some work in the social studies; 89.4 per cent., some work in the sciences. When we add to this group of subjects English and mathematics, taken by 95.2 and 87.2 per cent. of the teachers, respectively—as already shown in the upper portion of the table—we are urged

to the conclusion that these teachers have had rather broad general academic training. It appears, therefore, that the training of the teachers under consideration has conformed rather generally to the recommendation of the Committee of Seventeen that "the program of studies selected by each student should include work in subjects outside of those in which he is making special preparation, sufficient to give some insight into the different fields of knowledge and to avoid the dangers of over-specialization." It appears, also, that, as far as this large group of high-school teachers is concerned, there has been almost complete conformity to the recommendation that one or more subjects from the group of social studies be included in the preparation. Little can be said with any assurance as to conformity to the Committee's recommendation that a course in general psychology be included, because, for this investigation, this subject was placed in the list of professional subjects. Such evidence as is at hand in the last section of this report indicates that only slightly more than half the teachers reporting for our study had had either this course in general psychology or a course in educational psychology. The course in the history of philosophy, ethics or logic, which is the one remaining phase of general academic training recommended by the Committee, has been a part of the training of but slightly more than a half of the group of teachers under consideration in this study.

2. *Superintendents' Opinions as to Adequate General Academic Training*

Now that we have examined the recommendations of the Committee of Seventeen on general academic training and the facts as to the extent to which teachers have actually had such training, we may next make comparisons of the latter with the general academic training which the thirty-five superintendents who sent in usable replies considered to be the minimal amount adequate for teachers in their school systems. The superintendents' opinions are presented in Table XIV. The results shown in this table are not exactly comparable with the recommendations of the Committee of Seventeen or with the actual general academic training of these teachers as just reported, because in these latter cases the general

academic training includes merely those subjects taken in higher institutions. The superintendents were directed to indicate whether the different subjects should be taken in the high school, the college, in either, or in both. As a consequence, some subjects which are deemed necessary by the superintendents for adequate general training may be taken in the high school and not in higher institutions. On the whole, however, this table shows what subjects are considered by superintendents as most important as components of the general academic preparation of high-school teachers.

Table XIV is to be read as follows: 25 superintendents (71.4 per cent.) said that the general training of the adequately prepared teacher should include English in the high school; 28 superintendents (80 per cent.) English in college; 25 superintendents (71.4 per cent.), English in both the high school *and* college; 8 superintendents (22.9 per cent.) English in the high school *or* college; while all 35 superintendents, disregarding the place in which the subject is to be taken, say that it is a necessary part of the general academic training of the high-school teacher.

A glance at the summary column at the right of the upper portion of this table shows that three fourths or more of the superintendents would require courses in English, mathematics, history, economics, sociology, political science or civics, physics, botany, psychology, and physical or military training. A half or more, but less than three fourths, would include Latin, some modern foreign language, chemistry, physiography and geology, physiology, philosophy and ethics, public speaking and debating, and manual training or domestic science. The subjects thought to be least necessary—if one may judge by the percentages who would require them—are Greek, the graphic arts and astronomy. Further examination of the table will show that English and history are the only two subjects which more than 50 per cent. of the superintendents would require in both the high school and the college. Almost 50 per cent. would require mathematics, but of the other subjects listed only a fourth or fewer would require training in both institutions. It is interesting to note that 40 to 50 per cent. of the superintendents think it immaterial whether courses in economics, sociology, political science or civics, botany, physiology, public speaking and debat-

TABLE XIV

OPINIONS OF THIRTY-FIVE SUPERINTENDENTS AS TO THE GENERAL ACADEMIC TRAINING THAT SHOULD BE REQUIRED OF ALL HIGH-SCHOOL TEACHERS

	High School		College		High School and College		High School or College		Total for Groups	
	Number	Per Cent.	Number	Per Cent.	Number	Per Cent.	Number	Per Cent.	Number	Per Cent.
English.....	25	71.4	28	80.0	25	71.4	8	22.9	35	100.0
Mathematics.....	23	65.7	21	60.0	17	48.6	10	28.6	33	94.3
Latin.....	12	34.3	7	20.0	6	17.1	8	22.9	22	62.9
Greek.....	1	2.8	4	11.6	1	2.8	1	2.8	4	11.4
Modern Foreign Language.....	15	42.8	12	34.3	9	25.7	8	22.9	25	71.4
History.....	18	51.4	19	54.3	18	51.4	13	37.1	34	97.1
Economics.....	5	14.3	10	28.6	5	14.3	17	48.6	30	85.7
Sociology.....	5	14.3	14	40.0	6	17.1	15	42.8	30	85.7
Civics or Political Science.....	8	22.9	13	37.1	8	22.9	16	45.7	29	82.8
Chemistry.....	10	28.6	9	25.9	7	20.0	10	28.6	22	62.9
Physics.....	20	57.1	10	28.6	9	25.7	10	28.6	30	85.7
Botany.....	11	31.4	9	25.7	8	22.9	14	40.0	27	77.1
Zoology.....	7	20.0	8	22.9	4	11.6	8	22.9	17	48.6
Physiography and Geology.....	8	22.9	7	20.0	6	17.1	7	20.0	18	51.4
Astronomy.....	0	0.0	6	17.1	0	0.0	2	5.6	8	22.9
Physiology.....	3	8.7	5	14.3	1	2.8	14	40.0	20	57.1
Psychology.....	2	5.6	22	62.9	1	2.8	8	22.9	30	85.7
Philosophy or Ethics.....	0	0.0	17	48.6	0	0.0	3	8.7	19	54.3
Public Speaking and Debating...	7	20.0	12	34.3	7	20.0	15	42.8	24	68.6
Manual Training or Home Economics.....	11	31.4	7	20.0	5	14.3	7	20.0	18	51.4
Music.....	7	20.0	4	11.6	2	5.6	6	17.1	15	42.8
Graphic Arts.....	3	8.7	3	8.7	1	2.8	1	2.8	6	17.1
Physical Training or Military Drill	7	20.0	14	40.0	6	17.1	7	20.0	26	74.3
Some Foreign Language.....	16	45.7	12	34.3	9	25.7	13	37.1	26	74.3
Some Ancient Language.....	12	34.3	7	20.0	5	14.3	8	22.9	18	51.4
Some Modern Foreign Language..	15	42.8	12	34.3	9	25.7	8	22.9	25	71.4
Some Social Study	20	57.1	22	62.9	10	28.7	16	45.7	34	97.1
Some Science.....	19	54.3	15	42.8	7	20.0	22	62.9	34	97.1

ing are taken in high school *or* college. It is significant that the largest percentages of superintendents desire that the courses in mathematics, Latin, modern foreign language, physics, manual training or home economics, music and the graphic arts, be taken in the high school, while they desire that Greek, history, astronomy, psychology, philosophy and ethics, and physical or military training be taken in the college.

It is clear that superintendents are not in full agreement as to the subjects which should be required for adequate general academic training of the teachers for their school systems. Nor are they agreed as to whether the training in certain subjects should be given

in the high school or in higher institutions. The disagreement is not as great in extent, however, as may at first seem to be the case; since, if we disregard the grade of the institution in which the work in the subject is to be taken, we find that three fourths or more of the superintendents desire that their high-school teachers have training in English, mathematics, some foreign language, some social study, some science, psychology and physical or military training. If we recall in this connection the general academic training which the teachers report that they have actually had, the most striking difference we note is, that the superintendents would demand more psychology than the teachers have had, as well as work in physical or military training. With these two exceptions the general training received approximates closely the training which the superintendents would regard as adequate for the general academic preparation of high-school teachers in their school systems.

3. Conclusions and Recommendations on General Academic Training

(1.) The presentation of facts concerning the general academic training of teachers in the accredited high schools of the State of Washington indicates that this training tends in general to conform to the recommendation of the Committee of Seventeen. All but a small proportion of teachers during their periods of training in higher institutions have had some work in English, in foreign language, in mathematics, in science, and in the social studies, and, therefore, it may be said that the teachers in the accredited high schools of the State of Washington had included in their programs "work in subjects outside of those" in which they were "making special preparation, sufficient to give some insight into the different fields of knowledge and to avoid the dangers of over-specialization."

(2) Furthermore, the fact that all but a small percentage have had one or more courses in the group of social studies, as has just been stated, indicates almost complete conformity in the training of our group of teachers to the recommendation that preparation for high-school teaching include one or more courses from history, economics, or sociology.

(3) On the other hand, it appears that the courses in general psychology and in the field of history of philosophy, ethics and logic have not nearly as frequently been a part of the preparation of our group of teachers and, that, to this extent, the general academic training of the teachers in the high schools of Washington does not conform to the recommendations of the Committee of Seventeen.

(4) The tendency of the desires of the superintendents in this matter of general academic training seems to differ only slightly from the recommendations of the Committee. The former are more willing to dispense with the course in the field of philosophy, but desire that physical or military training be included in the preparation of the prospective teacher.

(5) Although the two sets of data are not readily comparable on account of the differing manners of inquiry in the two cases, it does not appear that superintendents should be greatly dissatisfied with the general academic preparation of the teachers in the high schools, inasmuch as the latter report having had in higher institutions, work in almost all subjects that the former would have included as a part of the teachers' general training in the high school, in the college or university, or in both. However, almost all superintendents would require a course in general psychology and some work in physical or military training. As has already been pointed out, a surprisingly small proportion of teachers report having had work in the former subject. No inquiry was made in the questionnaire to teachers as to their work in the latter field and, therefore, no statement may be ventured as to whether or not the teachers now in service can satisfy the superintendents' desires in respect to it.

(6) Without doubt, it has occurred to many readers that insistence upon general academic training may be carried so far as to preclude specialized and detailed training in the teaching subjects. It must be axiomatic that the greater the amount of the former, the less there must be of the latter. While a policy of teacher-training that over-stresses general academic preparation to the detriment of specialized preparation for the teaching subjects will often recommend itself (because subject-combinations are at present in a very chaotic condition and because the little prepara-

tion for a subject that the few semester-hours taken in it as a part of one's general academic training is to be preferred to no special preparation in the subject if one must give instruction in that subject,) nevertheless it can not be stated too emphatically that the continuation of such a policy would never permit us to rid the high schools of teachers who lack adequate special training in the subjects they are attempting to teach. In this connection it should be pointed out that by preparing teachers to give instruction in two, three, or four subjects, as has been recommended in an earlier section of this report, even though these subjects be somewhat related, we should to that extent guarantee the teachers' general academic training. In view of these considerations, the authors recommend that those having to do with the arrangement of curricula for prospective high-school teachers see to it that there is a proper balance of specialized academic training and general academic training. Obviously, much more intelligent action may be taken in this regard by those in authority in training institutions when the standard combinations recommended in the preceding section of this study shall have been determined.

III. TRAINING IN THE PROFESSIONAL SUBJECTS

We may now turn to the third section of our study—that which concerns the preparation in professional (pedagogical) subjects of the teachers in the accredited high schools of Washington. Before presenting the facts of preparation it will be helpful to quote again for the purposes of comparison from the Report of the Committee of Seventeen—in this instance from their recommendations on the professional subjects most suitable for the preparation of high-school teachers. The professional training of the prospective high-school teacher, according to this Committee, should include courses in the following subjects.

1. History of education (both general education and secondary education)
2. Educational psychology, with emphasis on adolescence
3. Principles of education
4. Special methods in teaching subjects
5. Organization and management of school systems

6. Practice teaching
7. School hygiene

1. *The Professional Training of the High-School Teachers of Washington*

The lefthand column of Table XV contains the list of professional subjects more commonly reported to have been a part of their professional training by the teachers in the accredited high schools of the state. Those of this list which are regarded by the writers as to a fair degree the equivalents of the subjects recommended by the Committee of Seventeen are printed in italics. Owing to the wide variation in content and organization of courses in education a considerable measure of error in thus signifying courses as equivalent must be admitted. Obviously, the courses in the history of education, educational psychology, principles of education, special methods, and practice teaching, of the list recommended by the Committee, may be taken to correspond with those under similar titles in Table XV. Organization and management of school systems may be held to be comparable with administration and supervision or with secondary education in that table. Because, in the brief characterization of the course in principles of education given in the report of the Committee, mention is made of the fact that under this head are to appear courses in "general method," the course in methods in Table XV is also regarded as having been recommended. Because the course in educational psychology is qualified in the report as being a course in "educational psychology, with emphasis on adolescence," the course in adolescence in the table is also similarly regarded. As very few teachers reported having had the course in school hygiene, it has not been listed in Table XV.

Scrutiny of this table reveals the fact that for large proportions of high-school teachers the recommendations of the Committee of Seventeen are still far from being realized. Less than three fourths of them have had courses in educational psychology; slightly more than two thirds have had courses in the history of education; less than three fifths have had courses in methods; slightly more than a third have had courses in special methods and in prac-

tice teaching; only slightly more than a fourth have had courses in administration and supervision; and barely a fifth have had a course in secondary education. If the recommendations of the Committee be taken as a criterion, teachers in the high schools of Washington have had insufficient professional preparation.

TABLE XV
NUMBERS AND PERCENTAGES OF TEACHERS WITH PREPARATION IN THE DIFFERENT PROFESSIONAL SUBJECTS

Subjects	Group I		Group II		Group III		Totals of Groups I, II, and III	
	Number	Per Cent.	Number	Per Cent.	Number	Per Cent.	Number	Per Cent.
<i>History of Education</i>	138	69.3	78	68.4	99	71.7	315	69.9
<i>Principles of Education</i> ..	117	58.3	60	52.6	91	65.9	268	59.4
<i>Administration and Supervision</i>	44	22.1	39	34.2	43	31.1	126	27.9
<i>Special Methods</i>	67	33.2	48	42.1	55	39.8	170	37.7
<i>Secondary Education</i>	42	21.1	21	18.4	29	21.0	92	20.4
<i>Educational Measurements</i>	13	6.5	7	6.1	14	10.1	34	7.5
<i>Methods</i>	72	36.1	60	52.6	77	55.8	209	46.3
<i>Elementary School Curriculum</i>	9	4.5	8	7.0	12	8.7	29	6.4
<i>Philosophy of Education</i>	54	27.1	31	27.2	23	16.6	108	23.9
<i>Educational Sociology</i> ...	23	11.5	17	14.9	33	23.9	73	16.2
<i>Educational Psychology</i> ..	145	72.9	82	71.9	103	74.6	330	73.1
<i>Adolescence</i>	31	15.8	29	25.4	43	31.1	103	22.8
<i>Industrial and Vocational Education</i>	24	12.1	15	13.1	15	10.9	54	11.9
<i>Foreign School Systems</i> ...	18	9.1	7	6.1	6	4.3	31	6.9
<i>Practice Teaching</i>	60	30.1	41	35.9	55	39.8	156	34.1
Total Number Reporting.....	199		114		138		451	

However, those who are interested in the professional training of teachers and who are at the same time in general agreement with the Committee may take hope from a comparison of the percentages of each of the three groups of teachers who report having had work in the several professional subjects. Group III, representing the teachers in the smaller high schools and those most recently trained, shows a higher percentage (having had almost all of these courses considered essential by the Committee) than does either Group I or Group II. It may be added also that Group II usually shows a higher percentage who report work in these same subjects than does Group I. This tendency is further emphasized by the facts as to the numbers of hours of work in professional subjects as shown in Table XVI. The first two horizontal lines of this table indicate that not all of the teachers in each group reported their hours of

professional preparation in usable form. It is significant that, of the entire group of teachers considered, only three reported that they had not had professional training. As one compares the number of hours of professional training in the different groups, he sees an increasing amount in each quartile as he proceeds from Group I to Group III. The only exception is the third quartile in Group III. This exception is probably due to the fact that Group III, containing the teachers most recently trained, includes fewer who have done any graduate work.

TABLE XVI
NUMBER OF SEMESTER-HOURS IN PROFESSIONAL SUBJECTS

	Group I	Group II	Group III
Number of Teachers in Group.....	213	117	143
Number of Teachers Reporting.....	167	102	137
Number Having had no Professional Training.....	2	1	0
First Quartile.....	9.8 hrs.	11.8 hrs.	14.8 hrs.
Median.....	15.7 hrs.	18.2 hrs.	19.3 hrs.
Third Quartile.....	24.2 hrs.	30.5 hrs.	27.6 hrs.

Thus, although we have found that these teachers in the State of Washington have not met the recommendations of the Committee of Seventeen in the matter of the professional subjects, there are indications of an increasing realization of the recommendation in the teachers more recently trained and, also, of a tendency for the number of hours of work taken in professional subjects to enlarge. If backed by proper state laws and by a continued demand for greater efficiency in instruction, one feels assured that the proper professional training of the teachers will be guaranteed.

2. *Superintendents' Opinions as to Adequate Professional Training*

It is sometimes openly asserted that there is little or no value in professional training and that superintendents would prefer teachers with very little or none of it as a component of their preparation. This assertion is manifestly without proof, if we may judge from the responses of the thirty-five superintendents who made replies as to what they would regard as minimal adequate professional training for high-school teachers. Of these superin-

tendents not one recommended no professional training. The least amount recommended was 8 hours, while the most recommended was 60 hours. The median number of hours recommended by the superintendents was 23.6 hours, while the lower and upper quartiles were 17.1 and 32.5 hours, respectively. Thus, if we compare these figures with those of Table XVI, we find that the superintendents desire more professional training than the teachers have actually had.

3. *Evaluation of the Different Professional Subjects*

At the same time that we are discussing the amounts of training in the different professional subjects which our group of teachers have had and the amount which the superintendents desire them to have, it is pertinent to present a summary of the estimates these teachers have made of the usefulness of these different subjects in their work of teaching. If we are to be justified in requiring teachers-in-training to spend as much time in the professional subjects as the Committee of Seventeen recommends or as the superintendents desire, the result of such training must make itself felt in the classroom. No doubt, the Committee of Seventeen, in recommending the list of subjects presented at the beginning of this section of our study felt that each of the subjects named is indispensable. As will be seen later, the superintendents agreed very closely with the Committee of Seventeen in the list of professional subjects which they thought each teacher should have. However, one test of the usefulness of a course to teachers in their training must be the trend of the opinions of those who have had the courses and who are engaged in teaching. At the same time that the group of teachers under consideration were asked to indicate the number of hours of preparation in each of the professional subjects they had had, they were asked to check the courses which had proved most helpful to them in their teaching. Because a considerable proportion of teachers overlooked the latter request, there are discrepancies in the numbers reporting having taken the different courses as presented in Tables XV and XVII. The latter table should be read as follows: of the 72 teachers of Group I who took history of education and checked some out of all the listed courses, only 5, or

TABLE XVII

NUMBERS AND PERCENTAGES OF TEACHERS INDICATING CERTAIN PROFESSIONAL SUBJECTS AS HAVING BEEN MOST HELPFUL IN THEIR TEACHING

Subjects	Group I			Group II			Group III			Total of Groups I, II, and III		
	Number taking and evaluating course	Number checking as most helpful	Per cent. checking as most helpful	Number taking and evaluating course	Number checking as most helpful	Per cent. checking as most helpful	Number taking and evaluating course	Number checking as most helpful	Per cent. checking as most helpful	Number taking and evaluating course	Number checking as most helpful	Per cent. checking as most helpful
<i>History of Education</i>	72	5	6.9	53	8	15.1	56	10	17.8	181	23	12.7
<i>Principles of Education</i>	66	27	40.9	43	12	27.9	51	32	62.7	160	71	44.3
<i>Administration and Supervision</i>	19	3	15.8	24	9	37.5	20	9	45.0	63	21	33.3
<i>Special Methods</i>	37	25	67.0	28	18	64.3	32	16	50.0	97	59	60.9
<i>Secondary Education</i>	21	9	42.9	15	7	46.6	21	6	28.6	57	22	38.6
<i>Educational Measurements</i>	5	1	20.0	5	3	60.0	9	6	66.6	19	10	52.6
<i>Methods</i>	33	18	54.5	41	23	56.1	42	29	69.1	116	70	60.3
<i>Elementary School Curriculum</i>	2	0	....	7	0	....	8	1	12.5	17	1	5.8
<i>Philosophy of Education</i>	29	6	20.7	21	6	28.6	9	1	11.1	59	13	22.0
<i>Educational Sociology</i>	13	7	54.6	12	5	41.7	19	9	47.4	44	21	47.7
<i>Psychology or Educational Psychology</i>	74	45	60.8	50	26	52.0	54	29	53.7	178	100	56.2
<i>Genetic Psychology or Psychology of Adolescence</i>	19	13	68.4	22	14	63.6	27	17	62.9	68	44	64.7
<i>Industrial or Vocational Education</i>	9	4	44.4	9	5	55.5	9	6	66.6	27	15	55.5
<i>Foreign School Systems</i>	7	3	42.8	6	0	....	4	0	....	17	3	17.6
<i>Practice Teaching</i>	33	11	33.3	26	13	50.0	31	21	67.7	90	45	50.0

6.9 per cent., said it had been "most helpful" to them in their teaching; of the 53 teachers, of Group II, only 8, or 15.1 per cent., said it had been most helpful, etc. A glance at the different subjects at the left in italics of this table, *i. e.*, the professional subjects recommended by the Committee of Seventeen, and at the corresponding percentages of all the teachers checking them as "most useful," will show that a majority of the teachers agree with the Committee with regard to the following subjects: special methods, methods, psychology or educational psychology, genetic psychology or the psychology of adolescence, and practice teaching. This list includes more than half of the recommended subjects. There is disagreement of these teachers with the Committee in the cases of the history of education, principles of education, administration and supervision and secondary education. When one considers that every subject mentioned in which the teachers agreed with the Committee deals primarily with the method of presenting subject matter or the laws

underlying such presentation, and also that these teachers were asked to designate those subjects which were *most useful in their teaching*, he can readily understand the close agreement in those subjects. Such an agreement is to be expected. If it is not present, something must have been wrong in the presentation of the professional subjects under consideration. One must admit surprise that just one half of all the teachers who have had the course in practice teaching do not indicate it as one that was "most helpful" to them in their teaching. This, of all courses, should prove the most helpful in teaching and the fact that it is not so regarded should constitute a challenge to all those who are responsible for this course. Apparently, principles of education, which is usually regarded as a fundamental subject, has not appealed to the teachers as being "most helpful" to the extent that should be expected. It may be significant to note that, in Group III, which includes for the most part the teachers more recently trained, over two thirds of all teachers taking the course indicate that it is most helpful in their teaching.

One is not greatly surprised at seeing small percentages of the teachers indicating the courses in the history of education, administration and supervision and secondary education as most useful in their teaching, since these subjects do not deal primarily with the teaching process, but with the development, organization and management of schools and school systems. The main value of these courses does not lie largely in their usefulness as an aid to classroom procedure.

Despite the qualification just stated, the authors can not refrain from noting that the course in the history of education, one of the oldest of the courses in the field and, therefore, one that has had ample time to have been made useful, and which, according to Table XV, has been taken by the second largest proportion—approximately 70 per cent—of our entire group of teachers, should have proved so sterile in utility in teaching as to have been checked as most useful by hardly more than one eighth of those who reported that it had been a part of their professional training. The percentage is so small as to leave grave doubt in the mind as to whether this course should be regarded as sufficiently useful to

be continued as a fundamental one in the training of high-school teachers, as it still is in many institutions.

Thus far we have been examining only the percentages given in the summary column at the right hand of Table XVII. Comparison of the percentages given for each of the three groups seems to warrant the assertion that some subjects are becoming helpful, for, in passing from Group I to Group III, increasing percentages of the teachers report them as having proved most helpful. This is especially true of administration and supervision, methods and practice teaching. The fact that this tendency is manifest in such a pronounced degree with these subjects must in large part be owing to recent development within the subjects themselves and to a better presentation of them. It is not impossible that better courses in these subjects may cause some of the related courses to decline in usefulness. One might reasonably anticipate, for example, that an especially practical course in methods would tend to minimize the usefulness of courses in special method or in general psychology. Such a tendency is already apparent in Table XVII.

Before turning to conclusions and recommendations drawn from this section of our study it seems worth while to make a comparison of the opinions of superintendents as to the value to teachers of the several courses in education with the opinions of the teachers themselves. Such a comparison is made in Table XVIII, the manner of assembly of which will require a word of explanation. The

TABLE XVIII
COMPARISON OF THE USEFULNESS OF THE PROFESSIONAL SUBJECTS AS INDICATED BY
TEACHERS AND BY SUPERINTENDENTS

	Ranking by Teachers	Ranking by Superintendents
<i>History of Education</i>	14	5
<i>Principles of Education</i>	8	2
<i>Administration and Supervision</i>	11	8
<i>Special Methods</i>	2	6
<i>Secondary Education</i>	10	4
<i>Educational Measurements</i>	6	7
<i>Methods</i>	3	1
<i>Elementary School Curriculum</i>	15	8
<i>Philosophy of Education</i>	12	9
<i>Educational Sociology</i>	9	5
<i>Psychology or Educational Psychology</i>	4	3
<i>Genetic Psychology or Adolescence</i>	1	3
<i>Industrial or Vocational Education</i>	5	7
<i>Foreign School Systems</i>	13	8
<i>Practice Teaching</i>	7	7

rankings of the subjects by teachers (in the first column of figures) have been arrived at by numbering the subjects in the order of the proportion of teachers reporting them as most useful (as already shown in Table XVII), the subject with the largest percentage being assigned the rank "1," the second largest, "2," and so on. In this column, since there were no identical percentages for any two subjects, there are as many rankings as there are subjects. For arriving at the rankings as assigned in the second column of figures, the expressions of opinion of superintendents as to the importance of each one of a long list of professional subjects in the training of the high-school teacher were used. The questionnaire to the superintendents included a request to signify which subjects of this list should be included in this training. The total numbers and percentages of the superintendents so indicating for each of the subjects were then computed. From the latter the ranking in the righthand column of Table XVIII was made, as in the case of the opinions of the teachers. Because there was identity of the percentages in several instances, there are not as many rankings as there are subjects. It should be stated, further, that the teachers and superintendents were not estimating the subjects on completely identical bases, since the former had been asked to signify those subjects most helpful in their teaching and the latter those they would consider essential to the preparation of a high-school teacher. These bases have enough in common, however, to justify a comparison of the rankings obtained.

It is interesting to note that the Committee of Seventeen, the teachers and the superintendents agree fairly well that the courses in special methods, methods, psychology or educational psychology, genetic psychology or the psychology of adolescence and practice teaching are most helpful in teaching. The teachers seem to disagree with the Committee and the superintendents with regard to the value of the courses in the history of education, principles of education, administration and supervision and secondary education. The probable explanations of this disagreement have already been given. The greatest divergence between the recommendations of the Committee and the superintendents' opinions is in that the latter desire the prospective teacher to have courses in educational

sociology, while the report of the former does not even make mention of the course, without doubt because it has made its appearance in the family of courses in education since the preparation of the report of the Committee.

No very sweeping conclusions can be drawn from this section on the evaluation of the several professional subjects. In the first place, the numbers of cases are often too small to allow for generalizations. In the second place, each of the several subjects must have been presented with an extremely wide variation in subject matter, methods, and effectiveness. In the third place, the teachers were asked to evaluate the courses only in terms of usefulness in their teaching. However, with all these limitations, we feel safe in saying that the Committee, the teachers and the superintendents agree that a majority of the recommended subjects are very useful in teaching. The data presented seem to urge that those who are responsible for subjects not shown to be useful in teaching should examine their courses to see if the fullest possibilities are being realized. The responses lead us to question, also, if the course in the history of education should be continued as one of the fundamental courses. Furthermore, it may be wise in the case of prospective teachers who may have a limited amount of time to devote to professional subjects to require them to spend the major part of this time upon those subjects in which there is more nearly universal agreement as to their utility in teaching. It is also apparent that further studies seeking to evaluate professional courses should be undertaken and, if teachers over wider areas are found to feel that certain subjects are not useful in their teaching, a revision of the recommendations of the Committee of Seventeen should be made.

4. Conclusions and Recommendations on Professional Training

(1) If the recommendations of the Committee of Seventeen in the matter of professional subjects fundamental to the training of high-school teachers be taken as a criterion, many of the teachers in the accredited high schools of the State of Washington are without adequate professional preparation. There is, however, a notable tendency to include more of these subjects in the preparation of

teachers-in-training, if we may judge from the fact that larger proportions of teachers more recently trained report having had them than do those whose training was received in a remoter period.

(2) Superintendents are inclined to desire more training in professional subjects than the teachers in the high schools under their supervision have received. This may be interpreted as an acknowledgement of the value of professional courses.

(3) The Committee of Seventeen, the teachers and the superintendents are in agreement in a majority of instances in their opinions as to which of the professional courses are most useful in the work of teaching. The teachers seem to dissent to some extent from the opinion held in common by the Committee and the superintendents that courses in the development and organization and management of school systems are very useful to them. This disagreement may be more apparent than real, since the teachers were not asked to pass judgment upon a completely identical basis with that used by the superintendents. It is so marked, however, in the case of one of the oldest of the professional subjects, the history of education, that there seems to be justification for excluding it from the list of fundamental subjects, even though we admit that utility in the actual work of teaching is not the sole criterion by which to judge the utility of a subject intended for the professional training of high-school teachers. This disagreement of teachers with the Committee and the superintendents should urge upon those responsible for the courses concerned a scrutiny of their content, organization and mode of presentation with a view to their reorganization to make them more useful to the teacher.

(4) Many considerations, both within and without the limits of the facts assembled for the present study, seem to be urging upon the educational world the making of a new authoritative statement on the professional component of the training of the prospective high-school teacher. Since the preparation and publication of the report of the Committee of Seventeen more than a decade ago the progress in the whole field of education has been nothing short of remarkable. Among other things, this progress has brought a more general acceptance of the scientific mode of attack upon educational problems. Again, a large part of this progress has been the in-

creasing dominance of educational thought by the concept of the socializing function of education. These and other reforms have brought into the field of the pedagogical, new courses and new types of material for most of the older courses. The presence in the list of professional subjects named in the tables of this report of such new courses as educational measurements, educational sociology and industrial and vocational education are cases in point. Such an enrichment and enlargement must be followed by a re-evaluation of the professional subjects, a re-evaluation which may give to some of the traditionally approved courses a more subsidiary place in the training of high-school teachers than they now occupy. The writers are convinced, therefore, that they can make no more valuable suggestion than that our educational associations that operate over wide areas should institute investigations, large in scope and as scientific as may be, aiming at the discovery of what should now constitute the professional training of the high-school teacher and that, after the results of such investigations are available, that these associations should make, in the light of them, a new authoritative statement to supplant that of the Committee of Seventeen.

SECTION III

REPORT OF THE COMMITTEE OF THE SOCIETY OF COLLEGE TEACHERS OF EDUCATION ON PRACTICE TEACHING FOR SECONDARY TEACHERS

CHAPTER I

RÉSUMÉ OF THE WORK OF THE COMMITTEE ON PRACTICE TEACHING FOR SECONDARY TEACHERS

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This Committee of the Society of College Teachers of Education was created by action of the Society at the Cincinnati meeting in 1915, and the writer was made Chairman. The membership of the committee has varied much during the four years, but in each year it has represented all sections and all of the major types of institutions for training secondary teachers.

The first report of the committee was made at the Detroit meeting in 1916. The material of that report has since appeared in publication, as follows:

1. Practice Teaching for Secondary Teachers, *Educational Monograph No. VII, Society of College Teachers of Education. Society Publication, No. 12.* G. M. Wilson, Secretary, Ames, Ia.
2. Practice Teaching for Teachers in Secondary Schools, A. R. Mead. *Bulletin U. S. Bureau of Education*, 1917. No. 29.

The second report of the committee was made at Kansas City in 1917. At that time, the following investigations were reported:

1. Effects of Practice Teaching on Pupils of Training School as shown by Pupils' Later Progress, W. S. Gray.

2. Forecasting Success in Practice Teaching, by C. E. Holley.
3. Some Interrelations of Departments or Schools of Education, W. G. Chambers.

The general report of the chairman of the Committee concerned the year's progress, and a recommendation that two standards be adopted by the Society. They were: (1) that the quantity of practice teaching required should be 2.5 to 5 semester hours' work; (2) that in no case should a special supervisor direct the work of more than 20 practice teachers at one time. These two standards were adopted. The investigations of Gray and Chambers were published in Bulletin 29 for 1917, referred to above. The study by Holley was published in the *Journal of Educational Psychology*, for October, 1916, Vol. VIII, pp. 495-497.

The third report of the committee was made at Atlantic City in 1918, and included the following: (1) general statement of work of committee; (2) paper by S. S. Colvin, The Most Common Faults of Beginning High-School Teachers; (3) report of Survey by A. R. Mead, Methods of Selection and Supervision of Practice Teachers; (4) report of Investigation by W. S. Gray and Geo. N. Cade, Objective Studies of the Achievements of Training School and Public School Pupils in the Freshman Year of the High School; (5) report by the Chairman of a study by Dean Fordyce of Nebraska on Correlation between General Teaching Power and Some Specific Teaching Qualities; (6) statement by Professor H. H. Foster of Arizona of a new plan for practice teaching during the summer.

In addition to the work of this committee, a paper presented at the same meeting by Professor Geo. Works, of Cornell University, described the Cornell plan for practice teaching in Agriculture and Home Economics. Colvin's paper has since been published in *School and Society*, Vol. VII, 1918. Work's paper, also appeared in *School and Society*, June 8, 1918. The study by Gray and Cade appeared in *The Elementary School Journal*, Vol. XIX, September, 1918.

The complete list of studies of the committee's report for 1918 includes one investigation not reported at Atlantic City. It is "Practice Teaching in Manual Arts and Industrial Education," by Professor F. C. Whitcomb, of Miami University.

The present compilation includes the material reported and collected in 1918 and a bibliography.

As a result of the work of this committee, the following standards for practice teaching have been derived:

- (1) The quantity of practice teaching should be 2.5 to 5 semester hours. (A semester hour is equivalent to one period of 45-60 minutes per week for 18 weeks).
- (2) The number of practice teachers supervised by a special supervisor at one time should in no case exceed 20. In actual practice, a much smaller number is very desirable.
- (3) Wherever possible, both public schools and schools controlled by the teacher-training institutions should be used for practice teaching.
- (4) The supervision of the practice teaching should be closely controlled by the department, or school of education.
- (5) At least four items should be included in the *general* direction of practice-teaching;
 - (a) regulation of work in subjects to be taught, *i.e.*, *content* subjects;
 - (b) regulation of work in courses in education;
 - (c) selection of candidates to be based partly upon the *moral* and
 - (d) the *physical* status of the candidate.
- (6) Observation of high-grade teaching, of real (not artificial) demonstration lessons, should be used as well as actual practice teaching.
- (7) Practice teaching should be required in at least two different subjects.
- (8) Practice teaching should include teaching in the advanced work of a subject, as well as in the beginning phases of that subject. For example, practice teaching in Latin should include teaching in Beginning Latin, Caesar (or second-year work), Cicero (or third-year work), and Virgil (or fourth-year work).
- (9) A type of practice teaching should be developed for *experienced* teachers, different from that for beginning teachers.

Other standards are included in the material of the Committee's report for 1918.

In addition to the derived standards, the following important facts have been well established:

- (1) That practice teaching is a highly desirable type of training for teachers.
- (2) That well-informed opinion favors practice teaching.
- (3) That practice teaching under *supervision* does not necessarily produce results inferior to other teaching.
- (4) That most institutions training secondary teachers are as yet doing but a small quantity of practice teaching.
- (5) That practice teaching is frequently hampered and weakened by an unsympathetic attitude of the administration of the Arts Colleges, and by the same attitude held by many faculty members of the Arts Colleges.
- (6) That normal schools are giving practice teaching for secondary teachers, probably as much or more in quantity than the colleges and universities.
- (7) That the types of organization and administration of practice teaching vary greatly among colleges and universities.
- (8) That conceptions of the specific outcomes of practice teaching are not usually well defined.
- (9) That methods of supervision and rating are not well planned, except in a few cases.
- (10) That, in view of these facts, there is need for the larger institutions to train men and women to supervise practice teaching for secondary teachers.

CHAPTER II

THE MOST COMMON FAULTS OF BEGINNING HIGH-SCHOOL TEACHERS¹

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During the past few years I have collected from one hundred and twelve teachers at the end of their first year of instruction in the high school a considerable number of papers in which are frankly discussed the chief problems of teaching as seen by these novices. The writers, while emphasizing various phases of class management and technique of instruction, are in the main conscious of four main problems; namely, (a) the control and discipline of their classes, (b) their personal attitude toward the class, (c) their methods of teaching, (d) their own inadequacy, lack of preparation and need of improvement.

The question of discipline is almost invariably mentioned. There is scarcely a paper that does not refer to it directly, and in the large majority of instances it is the chief problem discussed. Clearly, in the opinion of these beginning teachers, proper control of their classes is the all-important consideration in this first year of teaching. In this opinion they are probably correct. Common observation, as well as such investigations as those of Buellesfield² and of Moses,³ indicate that failures during the first three years of high-school teaching, the critical period for the teacher, are largely due to disciplinary troubles and related causes. Boyce,⁴ who has approached the matter of success in teaching from the positive side, agrees in placing good discipline as one of the most

¹Read before the Society of College Teachers of Education at Atlantic City, February 26, and reprinted with some omissions from *School and Society*, Vol. 7, April 30, 1918, pp. 451-458.

²*Educational Administration and Supervision*, September, 1915.

³*School and Home Education*, January, 1914.

⁴*Journal of Educational Psychology*, Vol. 3, and *Fourteenth Yearbook of the National Society for the Study of Education*, 1915.

important elements that constitute success in high-school teaching.

However, it should not be concluded either from the opinion of the teachers themselves, or from the findings of investigators, that the majority of beginning teachers are seriously lacking in control over their classes, or that marked disorder is the rule. If the novice has the good fortune to obtain a position in a well-organized and properly controlled school, he should have no serious difficulty with discipline. My personal observations lead me to believe that in the good high school, even among beginning teachers, marked disorder is rare. Yet, doubtless, faults in discipline are much more frequent with inexperienced teachers than with those long in the service, partly for the reason that the older teachers have learned how to manage their classes, but chiefly for the reason that those who are conspicuously weak in class-control have been eliminated from the teaching profession. If discipline in the first years of high-school teaching is a critical matter for a few teachers, and the important concern of many, it is not because in itself it is the one overwhelming consideration. It is vital not because there are no other problems to be considered, but because without reasonable control of the class nothing worth while can be achieved, and because the success or failure of the teacher is so largely judged by the one question: "Can he hold his class, and maintain reasonable order and attention?"

When the novice in high-school teaching has disciplinary troubles with his classes, this is due, according to my observation, to three main causes:

1. He lacks self-confidence; he is afraid of himself and afraid of his pupils.

2. He can not adequately imagine consequences; he lacks the ability to picture what is likely to occur; he does not know the first symptoms of disorder.

3. He does not initiate the proper habits of class attention and provide the necessary routine from the outset. He lets matters drift until the class has acquired bad habits, and the situation has become critical. Then he often acts too late. These three causes go together and are the natural results of lack of experience and confidence.

Because the young teacher lacks self-confidence, he relies at times too much on others, and at times too little. Many beginning teachers throw the burden of the discipline of their classes on a superior, generally the principal. They have not learned the most important principle of pupil-control, namely, the teacher must manage the class himself. They invariably send offending pupils to a disciplinary officer, or dismiss them from the room when such treatment means an ultimate report to the office.

On the other hand, because of this same lack of self-confidence, the beginning teacher is apt to conceal his troubles in discipline from his superiors and colleagues. He worries and broods over them, when a frank statement of his difficulties to those of experience and sympathy would generally materially help the situation. Inexperienced teachers have frequently asked me whether it would not be better for them to keep some of their failures in discipline to themselves, rather than to take the risk of giving the impression that they are having serious difficulties, when, after all, matters might be much worse.

Because the novice lacks confidence he is prone at times to act too slowly, thinking it better to let troubles take a definite form before he actively interferes. Again, he is apt to act rashly when class-control has reached a critical stage. On such occasions he frequently loses his head and 'goes up in the air.' A typical example of this is the following:

An inexperienced teacher of history was attempting to conduct a recitation in current events by means of a cooperative class exercise. There was a class chairman, and various individuals were making reports on assigned topics, while others were expected to participate in the discussion. The work was distinctly poor and the class was listless and in mild disorder. However, the teacher kept completely in the background and in no way attempted to direct the course of the proceedings. I advised him to interfere actively, but this he seemed very loth to do, offering various excuses. He showed by his whole attitude that he lacked courage; he was afraid to take a hand. Finally, he made some comments in a weak and timid manner, but the only effect that this had was to make matters worse. At last, when the class was reaching the stage of aggressive disorder, I urged upon him the necessity of acting with vigor. For a moment he wavered in a hesitating and helpless way, then of a sudden he burst out in a perfect furor of scolding and passionate anger.

While such faults in discipline as this are not confined ex-

clusively to beginning teachers, it has been my experience that a combination of what may be called the 'obstructed' and the 'explosive' will is rarely found among teachers of experience.

Because the novice in teaching cannot adequately evaluate acts and their consequences he often lets incipient disorder pass unnoticed, and acts only when too late. In several hundred cases of disciplinary troubles among beginning teachers that I have collected and analyzed, the majority would easily have been avoided had the teacher been able to detect the first signs of disorder and meet them at the time. The theory that "things will take care of themselves if you don't notice them" is not infrequently expressed by the novice. The trouble with this principle is that it never works, according to my experience.

Few beginning teachers realize the importance of a proper routine. Further, they have no adequate idea of how to plan and carry out such a routine. Some, I think the majority, have the impression that routine deadens and kills. They do not understand the basal fact that only through order is freedom and spontaneity possible. If they were more exacting in fundamental requirements, they could control their classes with much less friction. I have no figures to show the proportion of instances in which disciplinary troubles have their origin in a lack of organized procedure during the recitation, but in my opinion it is considerable.

While no teacher can hope to succeed without good discipline, while effective class-control is the *sine qua non* of good teaching, it is not good teaching itself. Unfortunately, it is too often regarded as such, both by teachers and by supervising officers. It is not to be wondered at, therefore, that the young teacher not infrequently looks upon himself as a pronounced success if he has succeeded in the initial problems of class-control. He exaggerates the importance of discipline, while he frequently is only dimly conscious of the vital matters that relate to the technique of teaching. According to my experience, few high-school teachers fresh from college, who have had no practical courses in teaching methods, have any definite conception of method or its necessity in teaching. They often are guilty of astonishing wastes in instruction without recognizing that such wastes exist; almost without exception they

'hear lessons' rather than teach, and are generally oblivious of the fact that each lesson should have a definite plan, if it is to be properly taught. Far too many high-school teachers conduct their recitations without definite and carefully worked out plans; novices as a rule appear to have no thought of a plan unless it is emphatically brought to their attention. Even then too frequently their first reaction is to consider the making out of such a plan as a clear waste of time, or at least as an unnecessary burden.

During the past six years I have had under my direction a considerable number of graduate students in Brown University who have been engaged in intensive work in practice-teaching in various high schools in Providence and its environs. These teachers have spent in teaching from one to three periods a day for an entire academic year. On the average, they are in ability and training clearly superior to the beginning high-school teacher. It can be assumed, therefore, that the faults that these cadet teachers show exist in a still greater degree among novices in high-school teaching. From the outset of their training I have emphasized with these cadet teachers the importance of a well-constructed lesson plan, and I have invariably found that at first they had absolutely no conception of how to prepare a helpful, working scheme of conducting their recitations.⁵

More than anything else, the character of the questions asked determines the nature and the value of teaching. Teachers as a rule are not skilful in the way in which they formulate their questions. The novice is particularly weak. At the start his questioning is almost entirely of the lesson-hearing type; he asks too many questions; he is impatient for answers; there is little poise and deliberation in his instruction.

His most common faults are:

1. He asks questions that are not well phrased. The English is frequently not above reproach; the wording is inexact and at times obscure. In the lesson plan the most important questions should be definitely formulated and stated.

⁵Further discussion of the character of the lesson plan, included in the original printing of this article, is here omitted since it is more extensively treated elsewhere in this Yearbook.—*Editor*.

2. Because of the inadequacy of his questions and also because of nervousness, the novice in teaching is prone to repeat or rephrase his questions, as for example:

Tell me why you think that is so; why do you think it is so; what is your reason for believing it correct; state your reasons.

Is this substance soluble? in what is it soluble? do you know whether it is soluble or not? have you tried to find out?

Give me the exact date of Shakespeare's death; was it before or after Bacon's death; have you looked it up; do you know?

What principle of factoring does this example come under? is it the first case, do you think? do you see any resemblance between this example and those that we have just been working at the board?

Because the novice does not sufficiently realize the importance of properly phrasing his questions and because he fails to formulate his pivotal questions in advance of actually asking them, they are frequently obscure and indefinite, as for example:

What do you think about the character of Napoleon?

What can you say about this canto we have just finished?

Tell us about "Snow-Bound."

What do you observe when you look at this picture?

Obviously, the fault in such questions as these is that they are not specifically directed toward the details that the teacher is seeking (or should be seeking) to bring out. Questions asked by the teacher are at times indefinite because they are not sufficiently simple to belong to the pupils' experience, knowledge, or manner of thinking. The recent college graduate often asks questions similar to those asked by his college instructors, not realizing that the high-school pupil is too immature to give an intelligent answer. Among the many questions of this type that I have noted during my observations of class teaching, the following are typical:

Is compensation the rule in human experience?

Is our behavior generally altruistic or egoistic?

What is the technical value of this scene? (The "Knocking at the Gate" in *Macbeth*.)

What refinements of humor have you noted in this sketch of Irving?

In what respects was Socrates a Sophist?

Quite frequently the young teacher when urged to conduct his instruction largely in the form of question and answer rests content in asking numerous trivial questions or questions that are purely informational or formal. He finds it extremely difficult

to frame queries that provoke thought on the part of the class as a whole or on the part of the individuals who chance to be reciting. Sometimes the questions are purely of the 'yes-or-no' type. At their worst these require no mental reaction whatsoever; at their best they are merely incentives to guessing, with a fifty per cent. probability of a correct reply. Such questions are for the most part brief, and in some recitations are asked literally by the hundreds. They do not need extended exemplification. These, however, are a few taken at random from a very long list:

T. "Do you agree with Emerson in regard to compensation?" P. "Yes, I think he is right."

T. "Do you think that most people get rewarded when they suffer, or are unhappy?" P. "In the majority of instances."

T. "Do you know of any persons who always seem to get the worst of it?" P. "I have known of some cases of hard luck all the time."

The above examples, while of the yes-or-no type, evidently possessed some value in stimulating thought. This much can not be said, however, of the following:

T. "Have I bisected this line?" P. "Yes."

T. "Is the line erected at this point perpendicular?" P. "It looks to me as if it was."

T. "Did Macbeth show any bravery in the first part of the play?" P. "Yes, he seemed to be brave."

T. "Was he brave when he saw the ghost of Banquo?" P. "No, he was frightened."

T. "Did he have the courage to commit the murder of the king?" P. "No, his nerve seemed to go back on him."

T. "Was the Lady Macbeth more resolute than her husband at this time?" P. "Yes, she seems so."

T. "Do you like this chapter?" P. "Yes."

T. "Does it make you respect the hero?" P. "Yes."

T. "Do you feel friendly toward him?" P. "Yes, I like him on the whole."

Often these yes-or-no questions definitely suggest the answer to be given, as for example:

Do you think Irving had a delicate sense of humor?

Was Napoleon chiefly interested in his own personal fortunes?

Is the scene in "Snow-Bound" true to life?

Was Sidney Carton a real friend?

Is the color of this deposit brown?

Was this a trying experience for David?

I have recently analyzed five hundred questions asked by teachers in their first year of high-school experience. These questions I have taken at random from a much larger number that I have observed and recorded. Out of this total number, I have found about five per cent. that could be considered in any way genuine thought questions. Over one quarter required no more definite answer than 'yes' or 'no.' Over three quarters were purely informational or quiz questions. About twenty per cent. were so suggestive in their phrasing that they were questions in form only. Eight per cent. were definitely faulty in their English; in thirty per cent. of the questions there was unnecessary repetition and rephrasing. While there were some unreasonably long and complicated questions, the majority of the questions averaged fewer than eight words, and the replies to these, fewer than four words, indicating that they were asked in a hurried and ill-conceived way, and that the recitation lacked poise and valuable mental reaction.

The nature of the questions asked during the recitation and the manner in which they are asked is, to my mind, the most vital part of the teaching. However, there are other important considerations that have to do with method, in which all teachers are at fault at times, and the novice in teaching more frequently. Lack of time makes it impossible for me to refer to these except in the briefest way.

All teachers waste time during the recitation; some experienced teachers waste at least fifty per cent. of their time, while novices not infrequently waste more. I recall one teacher, who has since made a pronounced success, who frequently spent thirty minutes of the recitation period in history in dictating an outline for the study of the new lesson; another who sent half of his pupils to the blackboard in geometry and questioned the remaining half on topics that were not vital, apparently for the purpose of killing time, and who later permitted the pupils to recite their proofs in a voice almost inaudible, so that the class as a whole got no benefit out of the exercise; a third who confined all of his attention to the pupil who was reciting with the result that each pupil got on the average less than three minutes' attention during the forty-five-minute period; a fourth who talked most of the hour while the class re-

mained stolid and mentally inert; a fifth who spent one entire period in conducting a demonstration in physics that only the pupils in the front rows could see; and so on. I would not, however, wish to give the impression that all, or most beginning teachers are guilty of such serious faults as these. However, it has been my experience that these novices in teaching at the outset waste on the average at least one third of the class exercise.

Beginning teachers, even to a greater extent than those of experience, violate the most fundamental principles of drill. In particular, they are not consistent and uniform in their practice, largely because they have not given sufficient consideration to methods of procedure and have no standardized experience to guide them and to prevent them from going astray. They often initiate superfluous habits, or habits that must be broken later. They are more likely to follow the logical than the psychological order, since they possess a more definite knowledge of the subject matter as it has been taught them in college, than they do of the minds of their pupils. They often introduce the most difficult and uninteresting parts of the subject first, making the beginnings irksome and unattractive; they do not realize the great importance of initiating a habit in the proper way and keeping the pupils under constant supervision; above all, they are prone to drill the few at the expense of the many.

While there are many other ways in which beginning teachers sometimes fail and often seriously, those discussed above are, according to the observations of the writer, the most frequent and the most serious. In one particular aspect of teaching, beginning teachers seldom fail, at least in such conspicuous and clearly evident way that it results in the loss of their position, and that is in knowledge of subject matter. This seems at times extraordinary, since beginning teachers not infrequently are called upon to teach subjects with which they have little familiarity, sometimes giving instruction in subjects they have not taken in college, and occasionally not even in the high school.⁶ The reason why they do not openly

⁶Doubtless, however, a scholarly knowledge of subject matter acts indirectly in matters of discipline and in methods of teaching, and is a hidden, though an important cause of success or failure.

fail is largely because so little scholarly knowledge is insisted on or expected in the non-technical subjects. Almost any teacher can keep just ahead of the class, and this is all the average principal seems to ask, if only the teacher has a fairly impressive personality and can exercise sufficient control over his classes. Where the beginning teacher fails most definitely is in class-control and class-methods, and this is just the point at which our preparation of the secondary teacher is the least efficient. In our undergraduate courses in college, we stress principles of education, history of education, educational psychology, and the like, but these are taught for the most part in an academic way, and far removed from practical problems. Our women's colleges that provide us with a large number of better-trained high-school teachers are for the most part committed to the belief that undergraduate instruction should be chiefly 'academic' in its nature, and that vocational and practical courses should be postponed for the graduate years and the vocational and technical schools. Thus, the college-trained teacher has frequently very little definite preparation for his work. This is all the more unfortunate because of the fact that in many instances he views teaching as a makeshift and a temporary expedient, and does not remain long enough in the work of high-school instruction to learn much through experience.

A recent inquiry made at the Women's College of Brown University revealed the fact that, while over half of the senior class planned to enter the field of teaching after graduation, only three of the entire number preferred this as a profession. Evidently, most of those who planned to teach did so because they felt that their college education had provided them with little else of immediate practical value. Doubtless most of them hoped to get out of teaching at the earliest opportunity and enter other and more attractive occupations. None of these young women had been trained to teach in more than a most general way. This state of affairs is probably true of our women's colleges in general, particularly in the east. The fact that our high schools in New England recruit their instructors in a large number of instances from graduates of women's colleges, and that these graduates often will continue to teach only until they can find something more congenial, makes

clear the desirability of giving these young people some specific, practical training for the work they are to undertake. This should be done even at the expense of removing from the curriculum some of the more theoretical courses in the departments of education and substituting practical courses, courses in applied educational psychology, and in general and special methods.

CHAPTER III

OBJECTIVE STUDIES OF THE ACHIEVEMENTS OF TRAINING-SCHOOL AND PUBLIC-SCHOOL PUPILS IN THE FRESHMAN YEAR OF THE HIGH SCHOOL¹

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The investigation which is reported in this article was undertaken to determine the relative efficiency of teaching in elementary training schools which are connected with normal schools and in elementary public schools. The investigation was prompted primarily by the fact that in some communities in which training schools are located patrons object to sending their children to the training school on the assumption that student teaching is inferior. Universities in many sections meet the same objection when they attempt to secure the co-operation of public high schools in the training of teachers.

A study of this problem was presented in a report² in 1917, in which the standing of elementary training-school pupils was com-

¹*Objective Studies of the Achievements of Training-School and Public-School Pupils in the Freshman Year of the High School*, George N. Cade. Master's Thesis. University of Chicago, March, 1918. Reprinted from *The Elementary School Journal*, Vol. XIX, December, 1918.

This study by Cade and Gray concerns the effect of teaching by practice teachers upon pupils in the elementary school, even though the measurements were undertaken upon high-school pupils. The study was carried out at the suggestion of Professor Mead's Committee, however, and is included in this *Yearbook* because it seems to be relatively much easier to get objective results of the effect of practice teaching in subjects taught in the elementary school; moreover, the argument can pretty safely be transferred to the field of secondary education. In any event, it puts the burden of proof upon those who oppose the development of practice teaching for prospective high-school teachers and who assert that this sort of teaching interferes with the progress of the pupil.—*Editor*.

²*Practice Teaching for Teachers of Secondary Schools*, Department of the Interior, Bureau of Education, Bulletin No. 29, 1917.

pared with the standing of public-school pupils in subjects taken during the first year of the high school. This report included data from the records of 1,500 pupils of five high schools which were connected with four normal schools of Illinois and with the University of Chicago. These high schools were selected because pupils from both types of elementary schools were found in the freshman classes, and they offered therefore an opportunity for making a comparative study of the standing of training-school and public-school pupils. The investigation revealed the fact that the average standing of the training-school pupils was approximately the same as the standing of the public-school pupils. The tentative conclusion was therefore drawn that no marked advantage could be attributed to training-school instruction or to public-school instruction.

The investigation which is reported in this article differs from the investigation of a year ago in that the achievement of the pupils was determined by means of standard tests based on elementary-school subjects. Tests in reading, writing, arithmetic, spelling, and language were selected, because these subjects include the basic lines of training given in elementary schools. The following standard tests were used: the Spiral Arithmetic Test, to measure mastery of the fundamentals in arithmetic; Stone's Reasoning Test, to measure ability to solve arithmetical problems involving more or less reasoning; Starch's Silent-Reading Test No. 8., to measure rate of reading; the Kansas Silent-Reading Test, to measure ability to interpret directions or questions read; the Gettysburg edition of the Ayres Handwriting Scale, to determine the quality of handwriting; words from the Ayres Spelling Scale, to measure ability to spell words in lists and words in sentences; and Starch's Language Test, known as Grammatical Scale A, to determine the pupil's control of language forms. Tests of a much wider variety should have been included in order to measure the results of instruction in all phases of elementary-school work. The conclusions to which this investigation points relate, therefore, only to the relative standing of training-school and public-school pupils during the first year of the high school in the fundamentals of elementary-school work as outlined above.

The following schools co-operated in the investigation: the public high schools of Goshen, Indiana; Ypsilanti, Michigan; and DeKalb, Illinois; the high schools of the University of Chicago and of Brigham Young University at Provo, Utah; and the high schools which are connected with the state normal schools at Normal, Illinois; Macomb, Illinois; Carbondale, Illinois; and Warrensburg and Springfield, Missouri. Each of these high schools, with the exception of the high school at Goshen, Indiana, is made up in part of pupils who have attended elementary training schools. This high school was selected as one of the ten because it included a representative group of pupils who have passed through public elementary schools and therefore could be used to advantage to check the results from the somewhat selected groups of public-school pupils who secure admission to high schools which are connected with normal schools.

The tests were given during November, 1917, to 572 pupils. Of this number, 185 entered high schools from training schools and 387 from public schools. The training-school pupils were classified on the basis of the number of years during which they had attended training schools. The validity of classifying pupils who have at-

TABLE I
EFFECT OF LENGTH OF ATTENDANCE IN THE TRAINING SCHOOL ON STANDING
IN SCHOOL SUBJECTS

No. of Years in Training School	No. of Pupils	Median Score	
		Stone's Reasoning Test	Kansas Silent- Reading Test
Entire course.....	45	9.60	23.33
7.....	15	8.80	22.50
6.....	25	10.50	25.00
5.....	24	8.15	25.83
4.....	17	11.14	21.25
3.....	21	12.00	21.25
2.....	18	10.43	23.33
1.....	20	7.50	20.00

tended a training school for less than one-half of the elementary-school period as training-school pupils might be challenged. In order to determine the effect of length of attendance in the training school on standing in elementary-school subjects the median scores of each group of pupils were determined for Stone's Reasoning Test and for the Kansas Silent-Reading Test.

The entries in Table I indicate that length of attendance in the

training school is not a large factor in determining standing in school subjects. The validity of including with the training-school pupils the group which had been in the training school only one year is open to question. Inasmuch, however, as this group represents such a small percentage of the total number of pupils, the final results of this investigation have not been modified to any great extent by classifying this group as training-school pupils.

The tests were given by the teachers of the high schools which co-operated in the investigation. Mimeographed sets of directions were prepared in order to insure a high degree of uniformity in the conditions and procedure of giving the tests. The tests were scored and tabulated by Mr. George N. Cade, a graduate student in the University of Chicago, to whom full credit should be given for whatever contribution this study makes. The results of the various tests will now be discussed separately.

The rate of reading was determined through the use of Starch's Silent-Reading Test No. 8. The median rates for each group are represented in Diagram 1. The numbers in the vertical column to the left of the diagram refer to the number of words read per second. The Roman numerals in the horizontal row at the bottom of the table refer to nine of the high schools which co-operated. The high schools were numbered in order on the basis of the median rates of the training-school pupils in each high school. The various high schools are represented in the same order in all the diagrams of this report. The solid oblique line represents the median rates of the various groups of training-school pupils included in this investigation, and the solid horizontal line represents the median rate of all training-school pupils tested. The dotted oblique line and the dotted horizontal line represent corresponding facts with regard to public-school pupils. The broken horizontal line represents the median rate of the pupils of Goshen.

The diagram reveals the following facts with regard to the pupils tested: (1) The training-school pupils read at a median rate of 4.79 words per second and the public-school pupils at a rate of 4.61 words per second. This represents a superiority of 0.18 word per second in favor of the training-school pupils. (2) The pupils of Goshen read on the average more rapidly than do the public-

school pupils of nine high schools, but not so rapidly as the training-school pupils. (3) The median rates of various training-school groups vary widely. The highest median rate is 6 words per second and the lowest median rate is 3.40 words per second. The

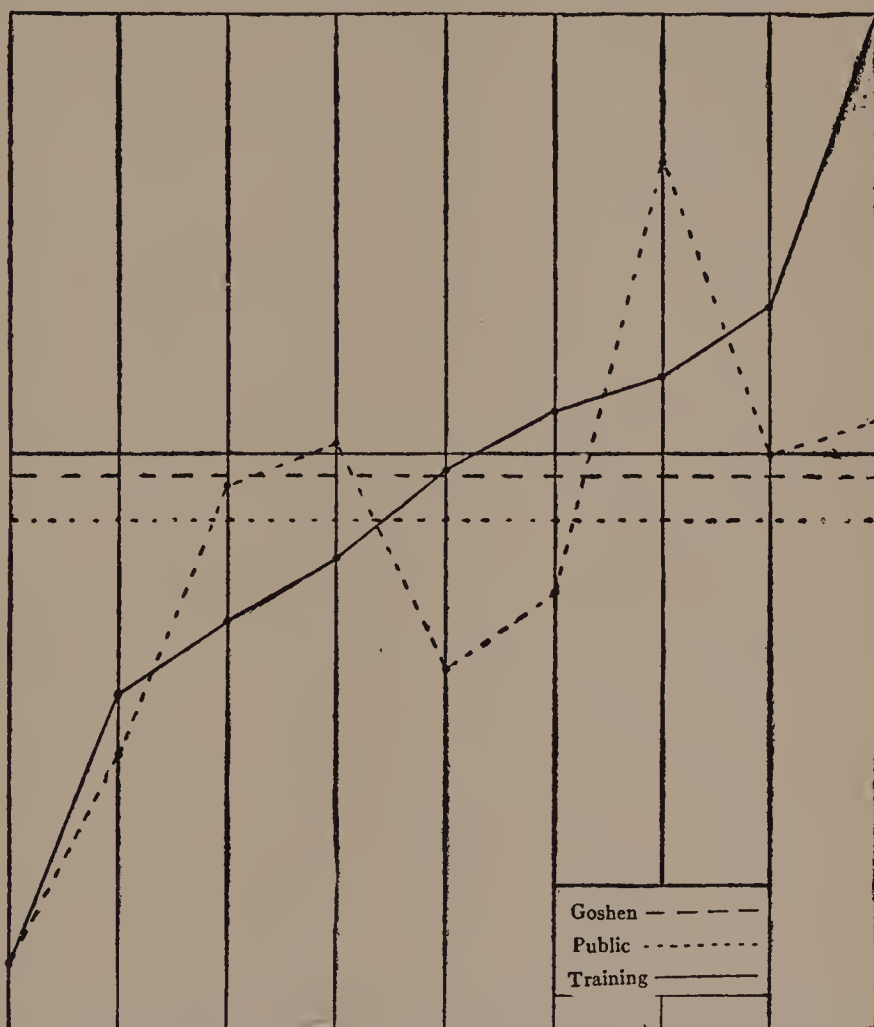


DIAGRAM 1.—Median rates of silent reading in words per second

variation in the median rates of the public-school groups is almost as wide. (4) The training-school pupils and the public-school pupils attending a given high school follow somewhat closely the same level of achievement. This fact is particularly noticeable in the cases of Schools I, II, III, IV, and less noticeably true in the

cases of several other schools. This general correspondence in rates indicates that there are community factors, such as similarity in economic status of pupils and common ideals and standards among all teachers of a community, which are more significant in determining the outcome of instruction than is either training-school instruction or public-school instruction alone.

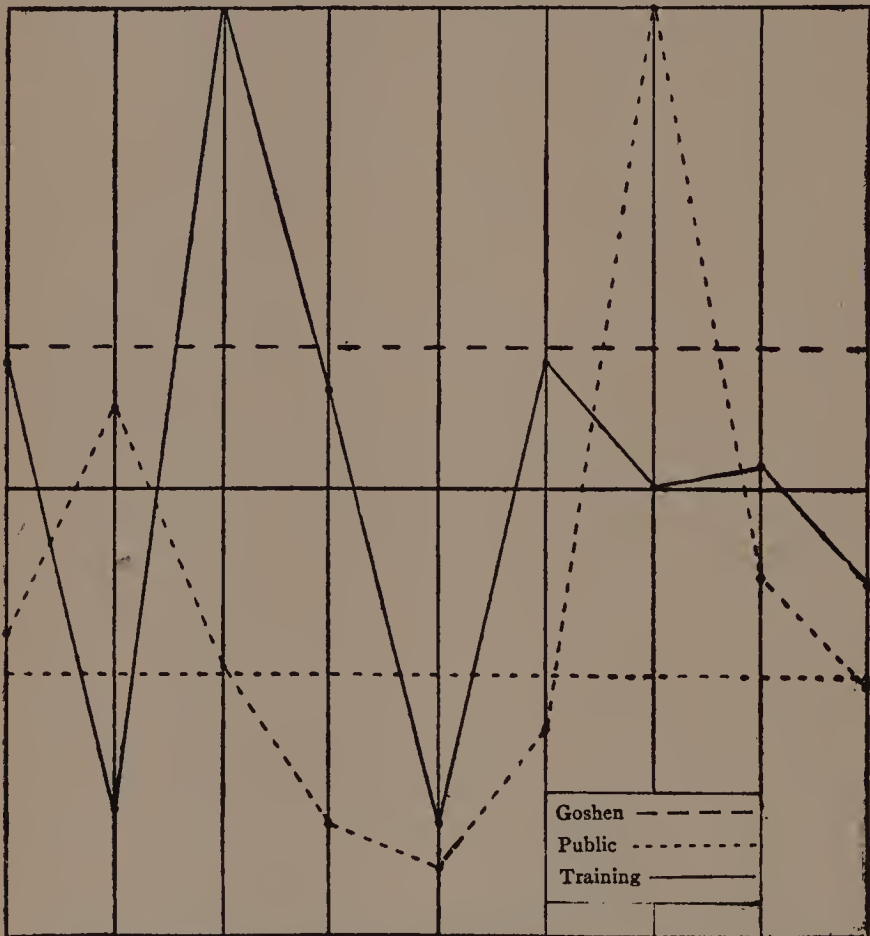


DIAGRAM 2.—Median scores in the Kansas Silent-Reading Test

The Kansas Silent-Reading Test was used to determine how well pupils understand what they read. The median scores are represented in Diagram 2. The median score of the training-school pupils is 23.33, of the public-school pupils 20.69, and of Goshen, 25.31. The median score of the training-school pupils is distinctly

superior to that of the public-school pupils. The difference is equal to 7.8 per cent of the score of the public-school pupils. In both rate of reading and comprehension the training-school pupils are superior to the public-school pupils. It should be noted that the median score of Goshen is superior to both of the median scores just considered. The diagram shows that there is wide variation in the scores of the public-school pupils in the various high schools.

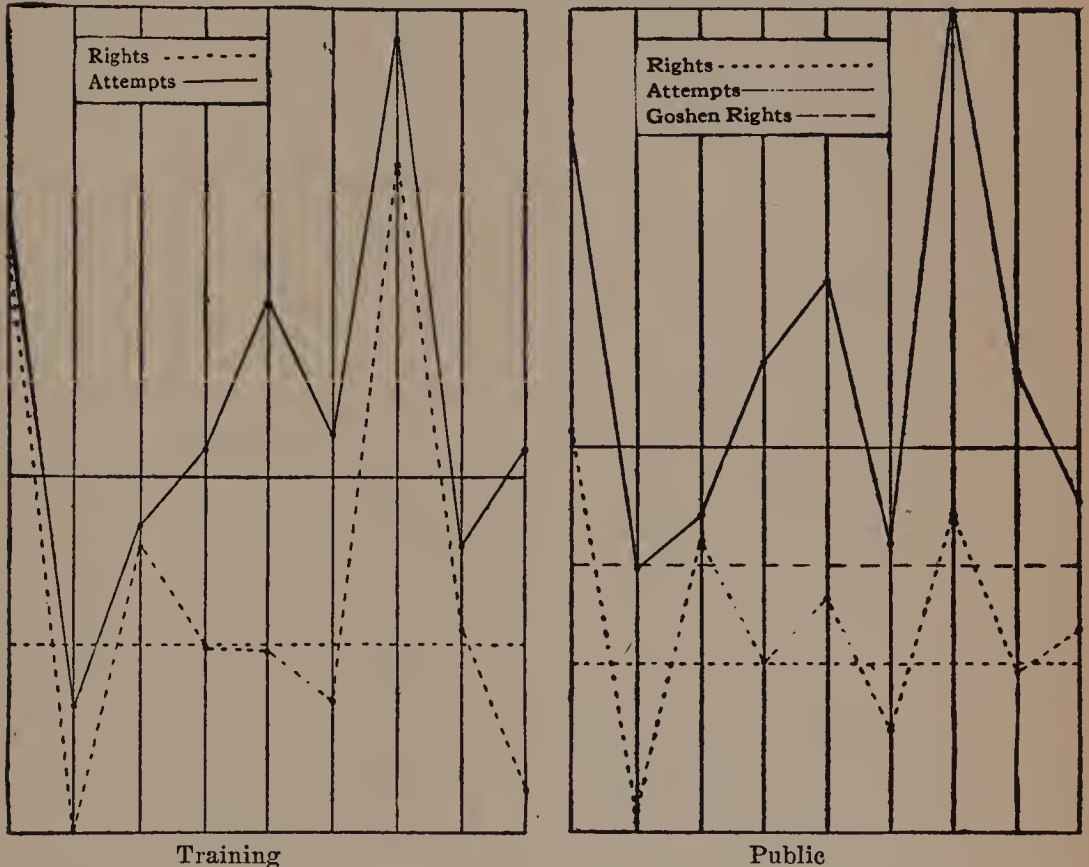


DIAGRAM 3.—Median scores in Set H of the Spiral Arithmetic Tests

The variation in the scores of the training-school groups is approximately as wide. The close correspondence in the scores of the two groups of pupils attending a given high school which was noted in the results for rate of reading is not apparent in this diagram. In fact, there is wide variation in the scores of the two groups of pupils in a number of schools. Schools II, III, IV, VI, and VII are

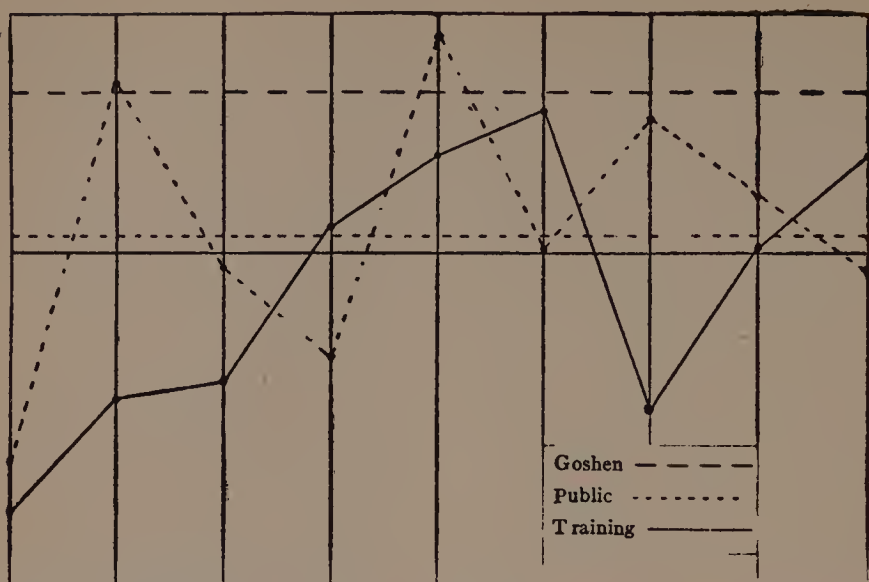


DIAGRAM 4.—Median number of rights in Set J of the Cleveland Spiral Tests

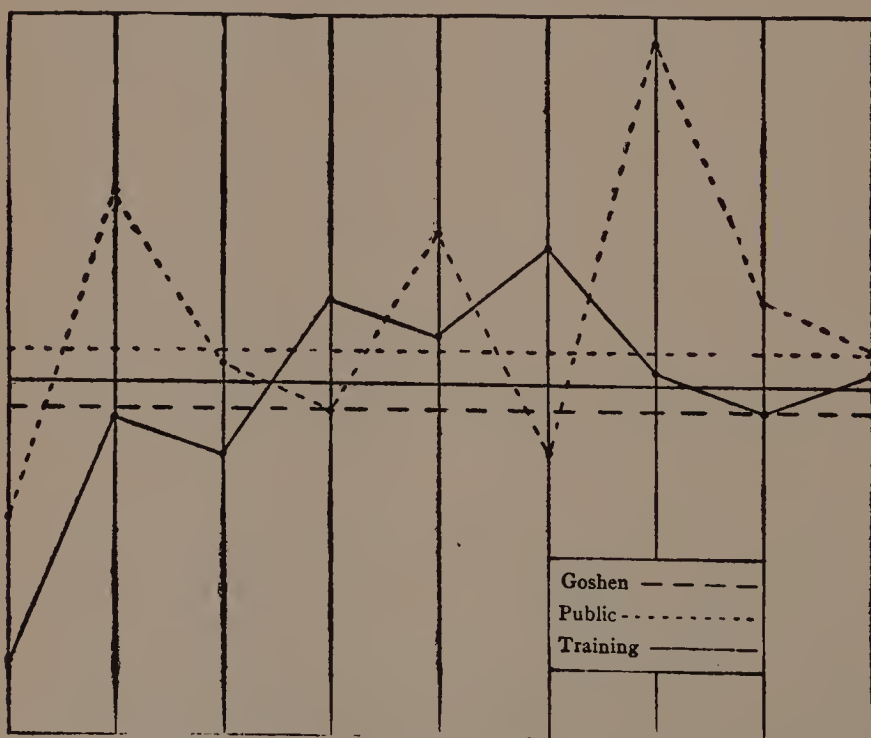


DIAGRAM 5.—Median number of rights in Set L of the Spiral Arithmetic Tests

illustrations. In some cases the public-school group secures the higher score, and in other cases the training-school group secures it. These facts indicate that the schools which send pupils to a given high school obtain more uniform results in rate of reading, as measured by the Starch Reading Test, than in comprehension of what is read, as measured by the Kansas Silent-Reading Test.

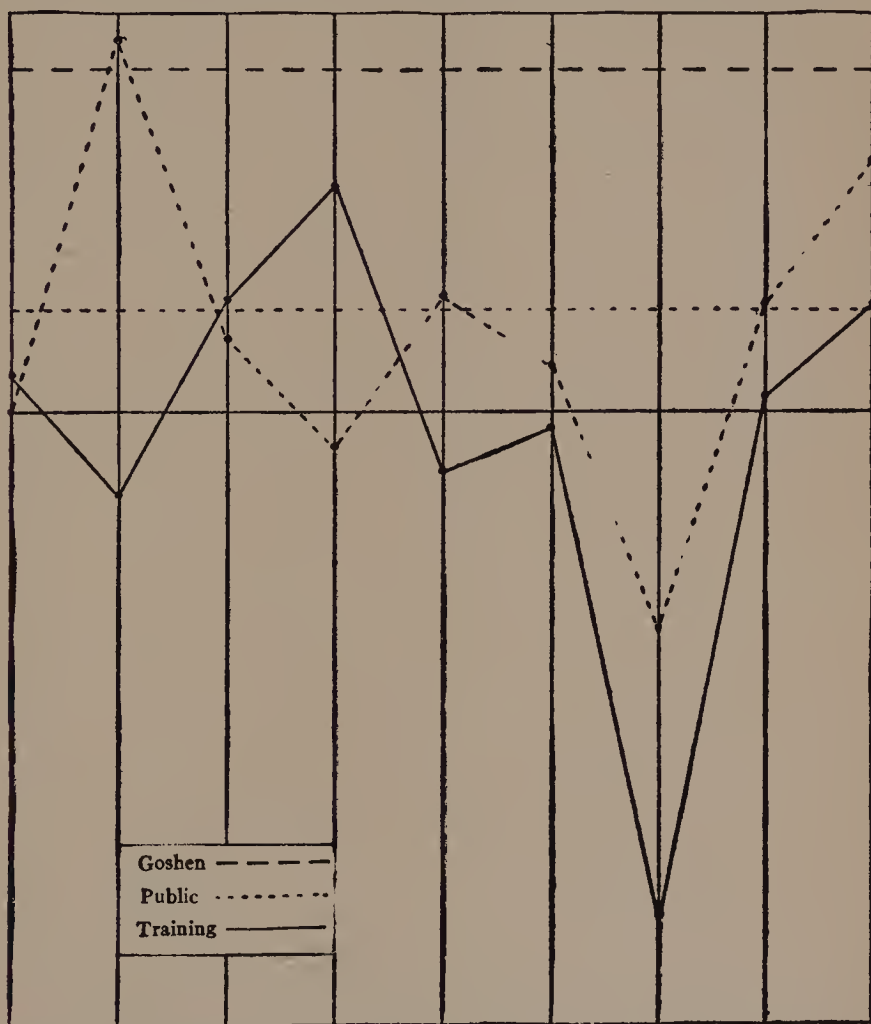


DIAGRAM 6.—Median number of rights in Set K of the Spiral Arithmetic Tests

The Spiral Arithmetic Tests used in the Grand Rapids and in the St. Louis surveys were used in this investigation to measure achievement in the fundamentals of arithmetic. Diagram 3 repre-

sents the median scores for Set H, which includes the addition and subtraction of fractions of like denominators. The left half of the diagram compares the number of problems attempted and the number of problems solved correctly by the training-school pupils. The right half represents the corresponding facts for the public-school pupils. The diagram shows that the public-school pupils attempted more problems on the average than did the training-

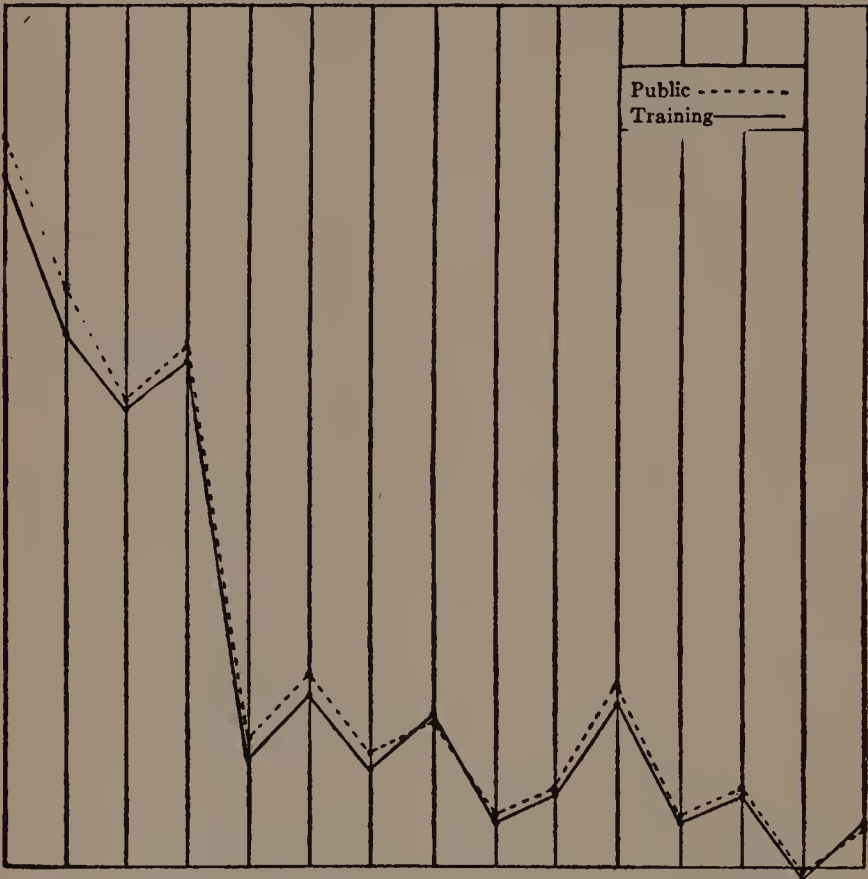


DIAGRAM 7.—Median number of rights in the fifteen sets of the Spiral Arithmetic Tests

school pupils, but that they solved fewer problems correctly during the assigned period.

Diagram 4 represents the median number of rights for Set J, which includes the addition of one-place numbers in columns containing thirteen numbers. The diagram shows that the public-

school pupils solved correctly more problems of this type in a given period than did the training-school pupils. The distinctly superior record of Goshen merits commendation.

Diagram 5 represents the median number of rights for Set L, which includes the multiplication of four-place numbers by two-place numbers. The diagram shows that the public-school pupils are only slightly superior to training-school pupils in this type of problem.

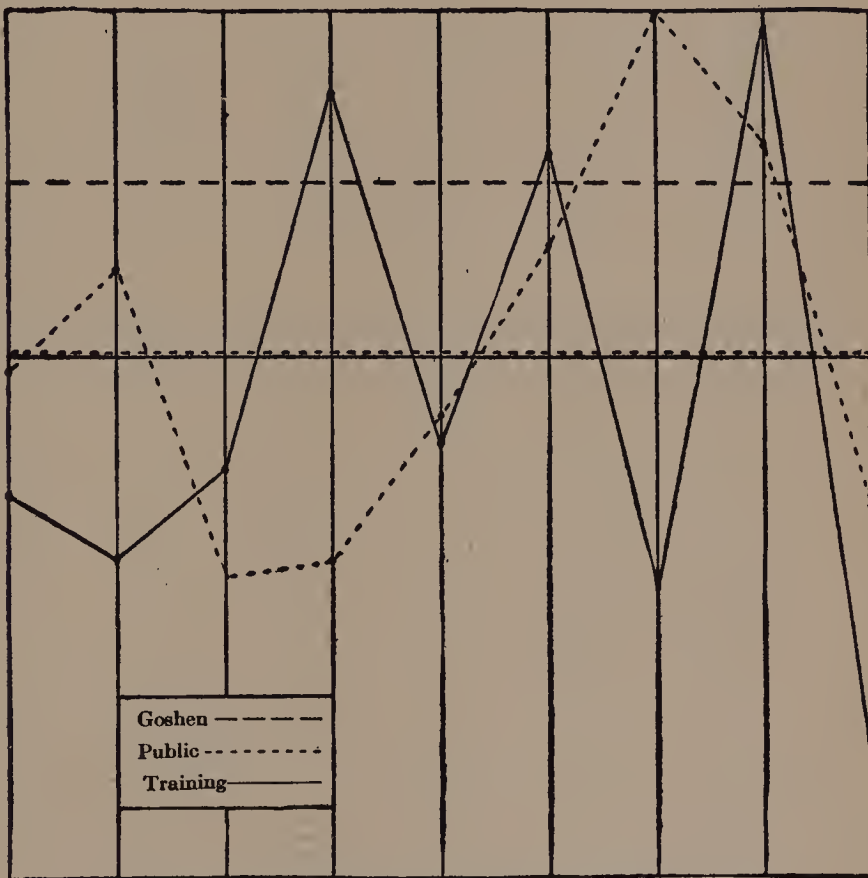


DIAGRAM 8.—Median scores in Stone's Reasoning Test

Diagram 6 represents the median number of rights for Set K, which includes the division of three- and four-place numbers by two-place numbers. As in the case of Set J, the public-school pupils rank distinctly higher than the training-school pupils. The

median score of Goshen is excelled only by the median score of the public-school group of School II.

The median number of rights for each of the fifteen sets of the Spiral Arithmetic Tests is represented in Diagram 7. The diagram shows that the public-school pupils rank higher than the training-school pupils in all sets excepting H and O. It is interesting to note that these two sets are the only sets in the entire test involving fractions.

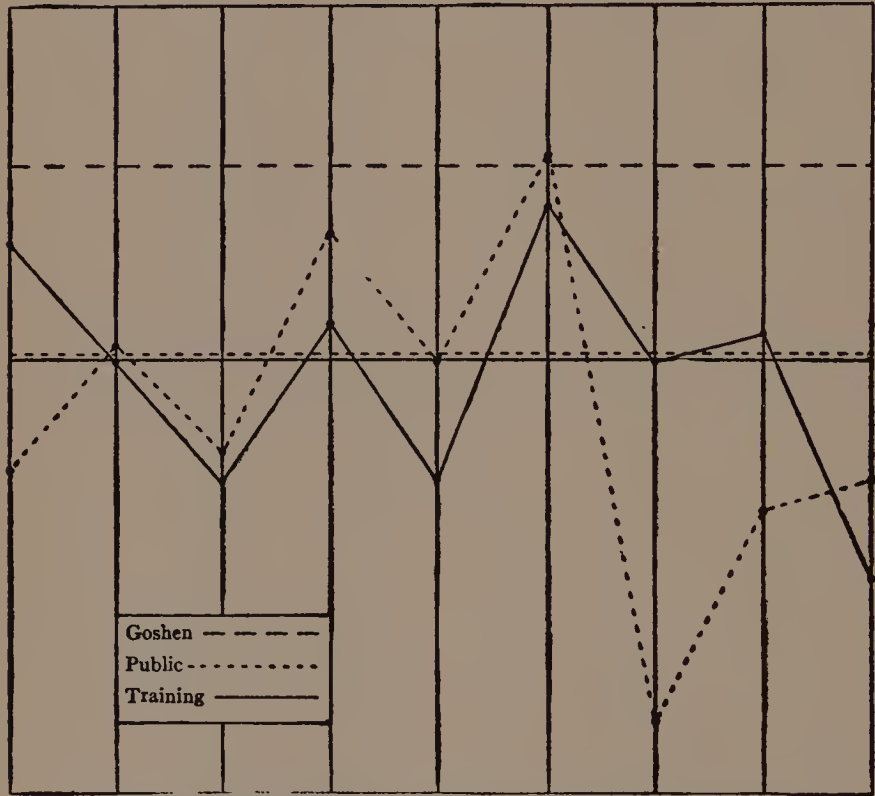


DIAGRAM 9.—Median scores in Starch's Grammatical Scale A

Stone's Reasoning Test was used to measure ability to solve arithmetical problems involving more or less reasoning. The median scores are represented in Diagram 8. The median score of the public-school pupils is 9.62, and the median score of the training-school pupils is 9.61. The difference is too small to justify us in attributing superiority to either group. Goshen, on the other hand, makes an unusually high score.

The median scores for Starch's Language Test are represented in Diagram 9. They are shown in the diagram to be approximately the same for training-school pupils and for public-school pupils. The superior record of Goshen is again noteworthy. Attention

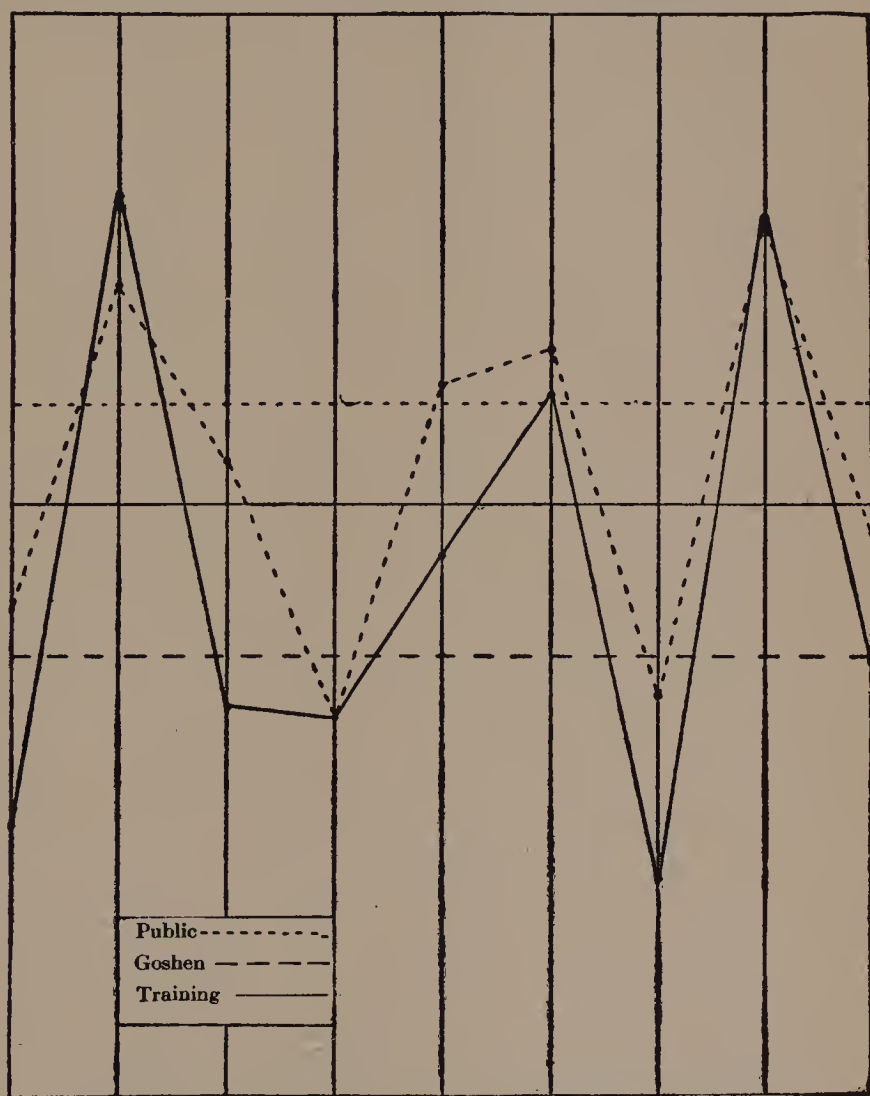


DIAGRAM 10.—Median scores in the spelling of words in lists

is called to the close correspondence in the scores of the two groups of pupils in the respective high schools.

Diagram 10 represents the median score of the training-school pupils and the public-school pupils in the spelling of words in lists.

The scores represent the number of words spelled correctly in a list of twenty. The diagram reveals the fact that the public-school pupils made a higher score than the training-school pupils. The

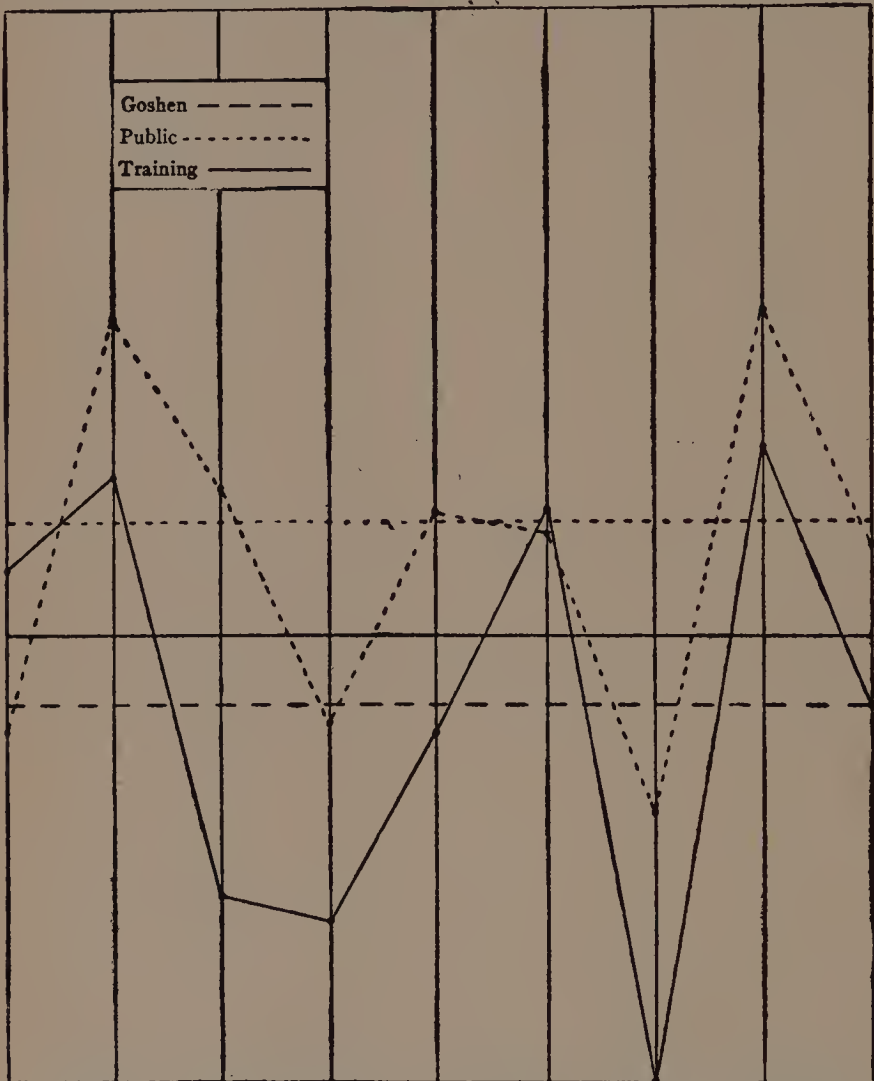


DIAGRAM 11.—Median scores in the spelling of words in sentences

unusually low score of Goshen indicates that this phase of the work in the elementary school of that city requires additional attention.

Diagram 11 represents the median scores of the training-school pupils and of the public-school pupils in the spelling of words in sentences. The relative standing of the three groups of pupils is

the same in this case as was revealed in the spelling of words in lists. The public-school pupils rank first, the training-school pupils second, and the pupils of Goshen third.

Diagram 12 compares the accuracy of spelling words in lists with the accuracy of spelling words in sentences. The left half of the diagram presents the facts for the public-school pupils and the right half the facts for the training-school pupils. The diagram shows that practically all the groups tested spell words in lists more accurately than words in sentences. The training-school group attending School I forms the only exception to the general statement just made. It would be very interesting to determine whether or not spelling is taught differently in this particular training school or whether the result is due to some chance factor. The diagram shows in addition that the difference between the results in the two types of spelling is greater in the case of the training-school pupils than in the case of the public-school pupils. Expressed in terms of number of words spelled correctly, the difference in the scores of the training-school pupils is 1.33 words, and of the public-school pupils 1.21 words. These facts indicate that training schools should give relatively more attention to accuracy in spelling, particularly when the words are used in context.

Diagram 13 represents the Quality Scores in Handwriting as determined through the use of the Gettysburg edition of the Ayers Handwriting Scale. The fact is revealed that the training-school pupils scored higher than the public-school pupils. Quality of handwriting is a second phase of school work to which added attention shall be given in Goshen, as is revealed by the results of this study.

Diagram 14 presents in graphic form the median scores of six of the tests. The results of the Cleveland Arithmetic Test are not included because of the limitation of space. The facts of this diagram, together with the discussions which have preceded, justify the following conclusions concerning the relative efficiency of training-school and public-school pupils in the fundamental subjects of the elementary-school curriculum:

1. The median scores for the various subjects reveal the fact that training schools and public schools alike do superior and infer-

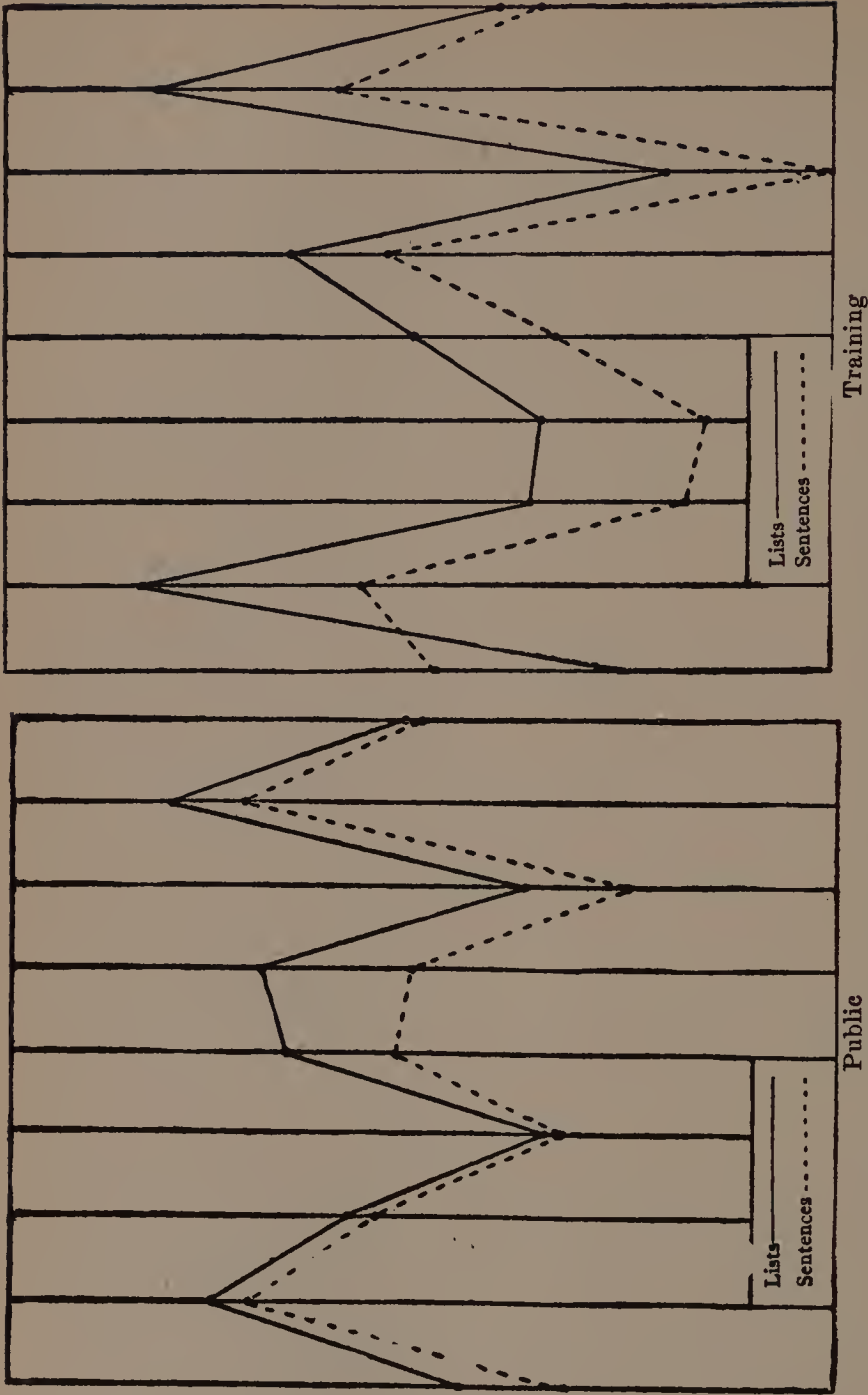


DIAGRAM 12.—Comparison of the accuracy of spelling words in lists and words in sentences

ior work. In Stone's Reasoning Tests and in Starch's Language Tests the median scores of the two groups of pupils were approximately the same. In rate of reading, in interpretation of what is read, in quality of hand-writing, and in the solution of two of the fifteen sets of arithmetic exercises the training-school pupils received the higher scores. In spelling words in lists and in sen-

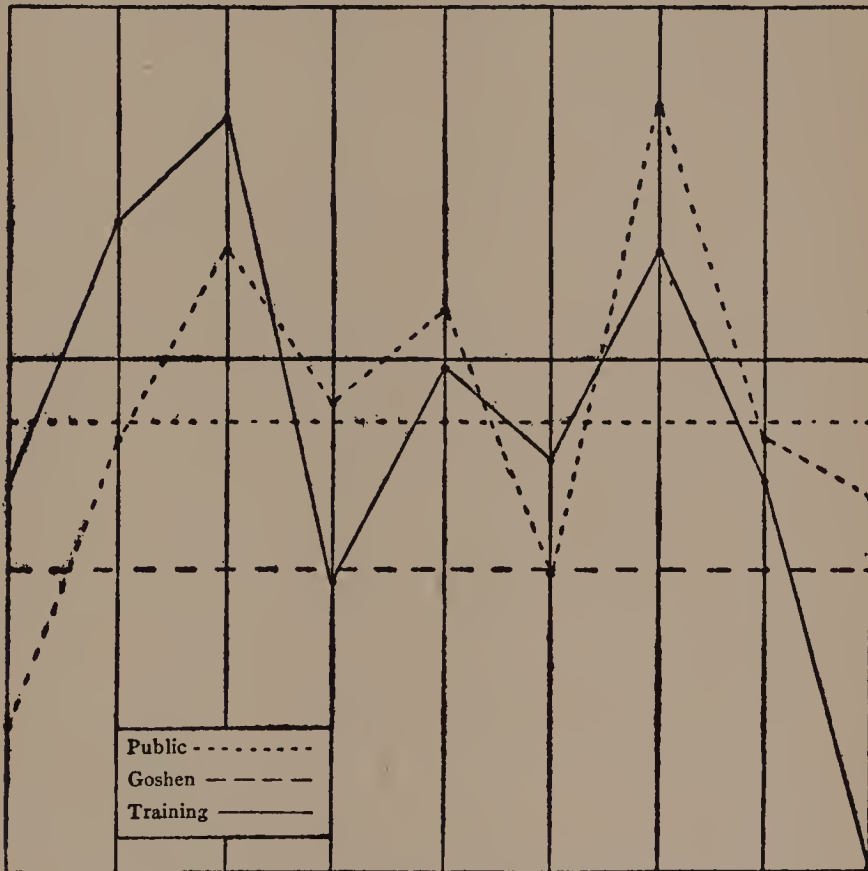


DIAGRAM 13.—Quality scores in handwriting

tences and in thirteen of the fifteen sets of arithmetic tests the public-school pupils received the higher scores. The scores indicate that training schools do slightly better work than public schools. This is particularly true in those phases of school work in which the reflective processes are involved. On the other hand, the public schools secure better results in the formal phases of school work, such as the fundamentals of arithmetic and spelling.

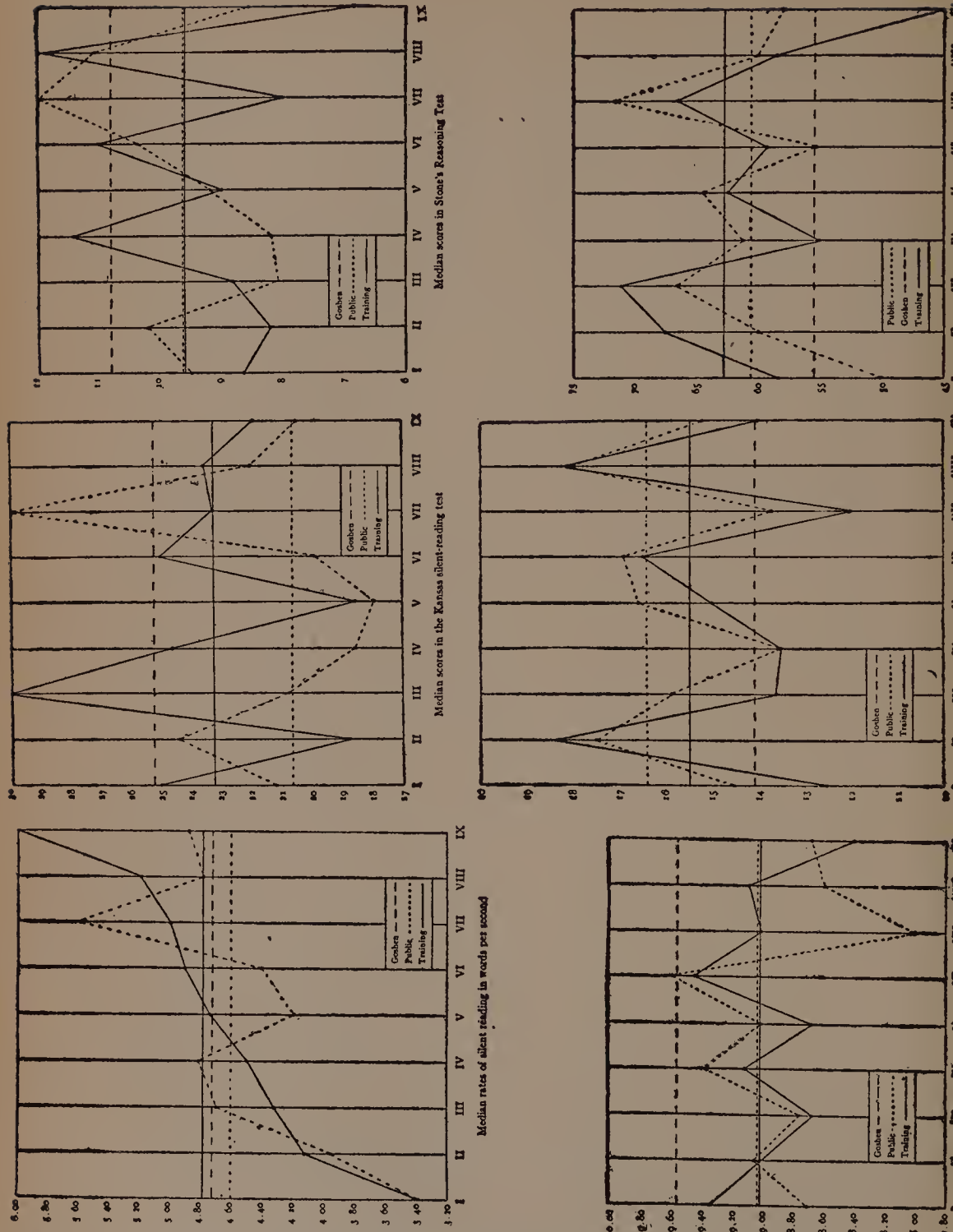


DIAGRAM 14.—Comparison of the achievement of elementary- and public-school children in six tests

2. There is close correspondence in the scores of the training-school groups and of the public-school groups in a large number of schools in language, spelling, rate of reading, and quality of handwriting. A similar situation was revealed in the case of the formal processes in arithmetic. These facts indicate that the community influences which are felt both in the training schools and in the public schools of a given community may be of greater importance in determining the results of instruction than are the special influences which are associated with either training schools or public schools.

3. The wide variation in scores of public-school groups and training-school groups which enter the same classes in high schools reveals the need for the introduction of scientific methods of directing and supervising the work of both types of schools. It suggests the advisability of requiring given levels of attainment in the fundamentals of the elementary-school subjects to secure admission to high schools. Furthermore, the study suggests that training schools should give more specific attention to the formal processes in some school subjects, and that public schools should train pupils more persistently in the reflective phases of school work.

CHAPTER IV

METHODS OF SELECTION AND SUPERVISION OF PRACTICE TEACHERS

A. R. MEAD

Professor of Education, Ohio Wesleyan University

PRELIMINARY PLANS FOR THE STUDY

The Committee on Practice Teaching for Secondary Teachers, in its report made at the meeting of the Society of College Teachers of Education held at Kansas City, recommended that several phases of the work of practice teaching be given further study, among which were methods of selection and supervision of practice teachers. Accordingly, the chairman of the committee undertook to investigate these two problems. It seemed best to do it by the method of a questionnaire, notwithstanding its evident difficulties and sources of error. A schedule of items to be studied was compiled and submitted to all members of the committee for their criticisms. The schedule, then modified, became the basis of a questionnaire. This was first tentatively formulated and submitted to the members of the faculty of the College of Education at Ohio State University during the summer of 1917. They each answered the questions and submitted proposed modifications in the questionnaire. This procedure was repeated four times. Then the questionnaire assumed the form in which it was sent out. During the month of September, 1917, these questionnaires were mailed to all departments of education, schools and colleges of education listed in the directory of the United States Bureau of Education for the current year. In spite of care to eliminate possibilities of misinterpretation, the results were in many cases of little or no value, and are not included in the tabulated data. On the other hand, many of the questionnaires were answered with great care. As might be

expected, some questions asking for data which could be secured only by computation, were not answered. A copy of the questionnaire is included in this report. The report takes up the data in the order of the items listed in the questionnaire. To all who co-operated in this study, the author is indebted for assistance.

QUESTIONNAIRE

Delaware, Ohio, September 20, 1917.

My dear Sir:—

At the Kansas City meeting of the Society of College Teachers of Education, the Committee on Practice Teaching for Secondary Teachers was directed to continue its investigation of the problems involved in such training, and to report its findings to the next meeting of the society. Hence this questionnaire which comes to you. On behalf of the committee and the society, the chairman appeals to you to give serious attention to the questions and answer them fully, for only on such data shall we be able to report accurate findings to the society and for your ultimate use.

In order that the data may be organized in time for the report to be made at the next meeting, it will be necessary to have replies made soon after receiving this questionnaire. Will you co-operate by so doing? Return all questionnaires to the chairman. Also send copies of any blank forms used for reports and records with explanation of their use. If you have a general director of practice teaching, please have him help answer the questionnaire.

Respectfully yours,
A. R. MEAD, Chairman,
Ohio Wesleyan University,
Delaware, Ohio.

Date of answer..... Institution.....

Name and title of person answering questionnaire:

.....

DIRECTIONS:—The questions are divided into two groups, one dealing with METHODS OF SELECTION OF PRACTICE TEACHERS, and one with PRACTICES IN SUPERVISION OF PRACTICE TEACHERS. To a very great extent questions are so worded that they may be answered by a single word or a number. An attempt has been made to use a terminology with generally accepted meanings, but if the meaning of any question is in doubt, please give your interpretation of it and answer it upon such interpretation. The semester hour referred to is the unit in use generally among higher educational institutions. It amounts to one hour of 45-50 minutes of class work per week during one semester of 18 (eighteen) weeks. "Combination Courses of more than Four Years" are courses leading to two different degrees, the work

for such degrees being entirely undergraduate work, e.g. an "Arts-Education Combination Course" might lead to the degree of Bachelor of Arts and also to Bachelor of Science in Education, cover five years' work above the high school and include no graduate work. "Principles of Teaching" is quite synonymous with "General Methods." All questions refer to the practice teaching done for the training of teachers for *secondary schools only*. Answer questions by yes or no whenever possible.

METHODS OF SELECTION OF PRACTICE TEACHERS

- 1. *Underscore class or classes from which practice teachers are selected: Freshmen; Sophomore; Junior; Senior; Fifth-year Combination Course of more than Four Years; Graduate.*
- 2. *TOTAL college credits (in semester hours) REQUIRED before student is eligible to do practice teaching.....*
- 3. *Credits (in semester hours) in subjects to be taught by practice teacher:*
 - 1. First Subject:
 - 1. Minimum required
 - 2. Average obtained.
 - 1. Estimated
 - 2. Computed
 - 3. Maximum obtained.....
 - 2. Second Subject:
 - 1. Minimum required
 - 2. Average obtained.
 - 1. Estimated
 - 2. Computed
 - 3. Maximum obtained.....
 - 3. Third Subject:
 - 1. Minimum required
 - 2. Average obtained.
 - 1. Estimated
 - 2. Computed
 - 3. Maximum obtained.....
 - 4. Fourth Subject:
 - 1. Minimum required
 - 2. Average obtained.
 - 1. Estimated
 - 2. Computed
 - 3. Maximum obtained.....
- 4. *Credits (in semester hours) in Education before allowed to do practice teaching:*
 - 1. Minimum required.....
 - 2. Maximum obtained.....
 - 3. Average obtained
 - (Estimated)
 - (Computed)
- 5. *Types of courses required in Education as prerequisites to practice teaching:*
 - 1. General Psychology Sem. Hr.
 - 2. Educational Psychology Sem. Hr.
 - 3. Principles of Teaching in Secondary Schools.....Sem. Hr.
 - 4. Special Methods of teaching subjects to be taught by practice teacher:
 - 1. In one subject Sem. Hr.
 - 2. In all subjects Sem. Hr.
 - 5. Administration of Secondary Education.....Sem. Hr.
 - 6. Observation of Teaching in Secondary Schools.....Sem. Hr.
 - 7. Social Phases of Education.....Sem. Hr.
 - 8. Principles, or Philosophy of Education.....Sem. Hr.

9. History of Education Sem. Hr.
10. Other types of courses *required*:
 Name of course Sem. Hr.

6. *Nature of Observation REQUIRED. Cross out "est" if data are correct:*
 1. Minimum number of actual visits to class required. (est)
 2. Minimum number of actual conferences required. (est)
 3. How observations are distributed:
 1. Previous to practice teaching? How many? (est)
 2. Parallel to practice teaching? How many? (est)
 3. Number concerned with general principles. (est)
 4. Number concerned with subject taught. (est)
7. *Scholastic rank, or grade required:*
 1. In general college work.
 2. In subjects to be taught.
 3. In prerequisite courses in education.
8. *Do you require any condition as to Physical Status of prospective practice teacher? If so, give your specific regulation covering this requirement.*
9. *Do you require any conditions as to MORAL STATUS of prospective practice teacher? If so, give your specific regulation covering this requirement.*
10. *Is preliminary apprentice work required in* (Cross out wrong answer)
 (1) keeping records Yes No
 (2) making reports Yes No
 (3) regulating hygienic conditions of room. Yes No
 (4) regulating hygienic conditions of pupils. Yes No
 (5) seating and organizing class. Yes No
 (6) other features of schoolroom management. Yes No
11. *Who sanctions the selection of practice teacher? (Cross out wrong answer)*
 1. Head of department, or school of education. Yes No
 2. Any specific instructor in education. Yes No
 3. Principal of training school. Yes No
 4. Regular teacher in training school. Yes No
 5. Superintendent of public schools. Yes No
 6. Board of education of public schools. Yes No
 7. President of college, or university. Yes No
 8. Head of collegiate department representing the
 subject to be taught. Yes No
 Instructor in such department. Yes No
9. Any other persons

12. *Requirement as to ability to use apparatus?*.....Yes.....No.....
If so, what is requirement?
13. *Tests to assist in selection of practice teachers?*
1. Standardized tests Yes.....No.....
1. Names of such tests:
2. Practical teaching test.....Yes.....No.....
3. Any special tests? Name of such special tests.
14. *Quality of writing ability required?*.....

PRACTICES IN SUPERVISION OF PRACTICE TEACHERS

(Cross out wrong answer)

1. *Preliminary selection and organization of content work to be taught:*
1. By practice teacher? Yes.....No.....
2. By some other person?.....Yes.....No.....
Whom?
2. *How such selection and organization is accomplished:*
1. By following textbooks.....Yes.....No.....
2. By use of syllabi.....Yes.....No.....
3. By other methods.....Yes.....No.....
Give other methods.....
3. *Planning of daily lessons:*
1. By practice teacher Yes.....No.....
2. By supervisor Yes.....No.....
3. By both Yes.....No.....
4. *Supervisor's visit to class:*
1. Number of partial periods (estimated).....
2. Number of whole periods (estimated).....
5. *Determining aims of course and daily work of practice teacher:*
1. By supervisor...Yes..No.. 2. By practice teacher...Yes..No..
6. *Are daily reports of practice teaching used?*
1. By supervisor...Yes..No.. 2. By practice teacher...Yes..No..
7. *Are weekly reports of practice teaching used?*
1. By supervisor...Yes..No.. 2. By practice teacher...Yes..No..
8. *Types of conferences used:*
1. General..Yes..No.. 2. Individual..Yes..No.. 3. Both..Yes..No..
4. Types of individual conferences used:
1. Before class period..... 2. After class period..... 3. Both.....
9. *Is parallel observation work required?*.....
1. How much?
2. Of teaching same subject?.....Yes.....No.....
3. Of teaching other subjects?.....Yes.....No.....
4. Of teaching in same school?.....Yes.....No.....

5. Of teaching in other schools?.....Yes.....No.....
10. *Do you rate the work of practice teachers?*
 1. By a letter-grade system.....Yes.....No.....
 2. By a percentage scale.....Yes.....No.....
 3. By a point system.....Yes.....No.....
 4. By any analytical method such as a score card
method Yes.....No.....
 5. By any other methods.....Yes.....No.....
11. *Who supervises practice teaching?*
 1. General director of practice teaching.....Yes.....No.....
 2. Special supervisor of subject taught.....Yes.....No.....
 1. On staff of college faculty.....Yes.....No.....
 2. On staff of public school faculty.....Yes.....No.....
 3. On staff of training school alone.....Yes.....No.....
 4. Connected with college and high school.....Yes.....No.....
12. *How many practice teachers per semester are supervised by the GENERAL DIRECTOR of practice teaching?*
 1. Estimated 2. Computed
13. *How many practice teachers per semester are supervised by a SPECIAL SUPERVISOR of practice teaching?*
 1. Minimum 2. Maximum
 3. Average obtained—Estimated Computed.....
14. *How much time in clock hours per week per practice teacher is given to supervision by special supervisor?*
 1. Minimum 2. Maximum
 3. Average obtained—Estimated Computed.....
15. *Distribution of year's instruction of a given class:*
 1. Portion taught by practice teachers:
 1. Estimated 2. Computed
 2. Portion taught by regular teachers:
 1. Estimated 2. Computed
16. *Quantity of practice teaching done by each practice teacher:*
 1. In class hours of 45 minutes:
 1. Minimum required..... 2. Maximum obtained.....
 3. Average obtained—Estimated..... Computed.....
 2. In class hours of 50 minutes:
 1. Minimum required..... 2. Maximum obtained.....
 3. Average obtained—Estimated..... Computed.....
 3. In class hours of.....minutes:
 1. Minimum required..... 2. Maximum obtained.....
 3. Average obtained—Estimated..... Computed.....

17. *Is practice teaching done in more than one subject?*
1. Portion done in first subject:
 1. Estimated.....
 2. Computed.....
 2. Portion done in second subject:
 1. Estimated.....
 2. Computed.....
 3. Portion done in third subject:
 1. Estimated.....
 2. Computed.....
 4. Is practice teaching in different subjects done:

contemporaneously?..... or consecutively?.....
18. *Cost of supervision per practice teacher:*
1. In salary paid supervisor.....
 2. In securing practice teaching facilities.....
19. *Do you exempt anyone from doing practice teaching?*
1. Because of previous teaching experience?.....Yes.....No.....
 1. If so, how much previous teaching experience is regarded as equivalent to a semester-hour of practice teaching?
 1. If experience has been in high schools?.....
 2. If experience has been in elementary schools?.....
 2. Because of any other factors?.....Yes.....No.....
 1. If so, what are the factors?
20. *Is practice teaching credited towards requirements for a degree?*
1. For the B. A.?....Yes..No.. For degree in education....Yes..No..
 2. How many periods of practice teaching of 50 minutes do you require for a semester-hour of credit?.....
 3. How many periods of practice teaching of 45 minutes do you require for a semester-hour of credit?.....
 4. How many periods of laboratory teaching in science of 45 minutes do you require for a semester-hour of credit?.....
 5. On what basis, as the case may be, do you give or refuse credit?.....

A. METHODS OF SELECTION

1. *Classes from which Practice Teachers are Selected*

Reports from 163 institutions afford the following tabulation:

Freshmen.....	1 institution
Sophomore.....	9 institutions
Junior.....	28 "
Senior.....	92 "
Combination fifth-year course.....	9 "
Graduate.....	24 "

Various combinations of classes exist. Shaw University reports that practice teachers are selected from freshmen, sophomore, and junior classes. The University of Washington selects these

teachers from junior and senior classes and from the fifth year of combination courses. They are selected from the sophomore, junior, and senior classes in the following institutions: William and Mary, Milwaukee-Downer, Lombard, Illinois Woman's College, and Temple University. Ohio University, Ohio State University, Boston, Stanford, Indiana, and Iowa State select these teachers from seniors, graduates, and fifth-year of combination course. Western Reserve, Chicago, Otterbein College, North Georgia Agricultural College, Pittsburgh, Pennsylvania, Northwestern, Defiance College,

2. *Total College Credits in Semester Hours Required Before Student is Eligible to do Practice Teaching*

Distribution of Credits		Distribution of Credits	
Number of Required Semester Hours	Frequency (Number of Institutions)	Number of Required Semester Hours	Frequency (Number of Institutions)
8	1	89	1
10	1	90	34
12	1	92	2
30	3	93	2
34	1	94	3
40	1	95	2
45	1	96	2
50-60	1	100	4
56	1	104	1
60	7	105	4
64	4	108	1
65	1	110-120	1
80-100	1	112	2
84	3	120	3
84-90	1	124	1
		124-136	1

West Virginia Wesleyan, Mt. Union College, Grand Island College, Manhattan, and Central University (Ia.) select from junior and senior classes. Selection from seniors and graduates is the practice at Teachers College (Columbia), College of the City of New York, West Virginia University, Oregon, Kansas, Louisiana, Utah, Nevada, Maine, Ohio Wesleyan, Oberlin College, and Hiram College. Selection from graduates and fifth year of a combination course is the practice at Cincinnati. Massachusetts Agricultural College selects from juniors, seniors and graduates. It is thus evident that the prevalent tendency is to select practice teachers from groups of students who have had three or more years of college training.

The mode, that is the commonest quantity, is 90 hours. Its A. D. is 13.6. The fact that 90 is also the median shows that there are just as many institutions having a lower requirement than 90 hours as there are having a higher requirement—29 in each case. On the other hand, the lower limit is 82 hours below the mode, while the maximum is but 46 hours above the mode.

The types of institutions which require the modal tendency in hours of college credit, less than the mode, and more than the mode, reveal another tendency. The table below gives these data.

Type of Institution	At Mode	Above Mode	Below Mode
Per Cent. Colleges.....	47	50	68.9
Per Cent. State Agricultural Colleges..	3.3	14	3.3
Per Cent. State Universities.....	30	17	14.0
Per Cent. Non-State Universities.....	....	10	3.3
Per Cent. Municipal Universities.....	....	....	3.3

This table is to be read thus: of those 34 institutions requiring the modal number of hours (90), 47 per cent. are classed as 'Colleges,' 3.3 per cent. as 'State Agricultural Colleges,' etc. It appears from the third column that the colleges are the institutions which are most likely to have the lower standard. Other tendencies are not marked enough to generalize. (The per cents given in the table are per cents of the group indicated and not the per cents of total number of colleges, or state universities, etc.)

3. Credits in Semester-Hours in Subjects to be Taught by the Practice Teacher

<i>In first subject</i>					
	(Median)	A. D.	Min.	Max.	Freq.
Minimum required.....	12	6.8	2	30	58 institutions
Average obtained.....	18	7.2	2.5	35	44 "
Maximum obtained.....	26	12.2	3	60	35 "
<i>In second subject</i>					
Minimum required.....	12	4.1	3	24	28 "
Average obtained.....	15	3.4	3	30	20 "
Maximum obtained.....	18	8.4		60	17 "
<i>In third subject</i>					
Minimum required.....	12	3.5	6	18	9 "
Average obtained.....	10	5.7	3	24	7 "
Maximum obtained.....	15	8.7	6	35	6 "
<i>In fourth subject</i>					
Minimum required.....	16	5	8	18	3 "

It is of interest to note that there are three institutions which report a minimal requirement in a fourth subject, and nine, in a third subject. It is, however, discouraging to discover that but 58, or 27.5 per cent. of the 211 institutions replying have any minimum of credit required in the first, or major, subject to be taught by the practice teacher; more discouraging to note that though the minimum *required* is low, the average *obtained* is 6 hours higher *in but 20.8 per cent.* of the 211 institutions. Four fifths of the 211 institutions are having their students begin practice teaching with credits in the subject to be taught which average less than 18 hours! Again, it would seem that the minimum required is too low and that the median of the average obtained is about what the median of the minimum required should be, in most subjects, at least, if it is to be considered the subject to occupy the major portion of the time of the teacher. Again, in spite of the obvious need for acquaintance with a second subject to be taught, but 13.3 per cent. of the 211 institutions report any requirement of credit in a second subject. Thus the tendency to disregard this need is much greater than required credits in major.

Again, it is shown that *some* institutions require a very low minimum of credit in the subject to be taught. Strangely enough, this minimum *increases* in the second subject, and is greater in the third subject than the second. If the subject to be taught is one which the practice teacher studied in a secondary school, the very low minima have partial justification; if not, they should put any institutions to shame that use such requirements! The *maxima* obtained are represented by only an occasional institution, if returns are accurate. These data are of very great importance to the preparation of secondary teachers. If such teachers are to be well trained, it would seem the part of wisdom to undertake to train them in about two or three subjects to be taught. These data show that our teacher-training institutions for secondary teachers are quite generally neglecting this part of the work. Why it is neglected is not easy to understand.¹ It would seem a comparatively

¹It is probably due to the present inability of many institutions to supply practice teaching facilities and to provide adequate supervision for practice teaching. In spite of these conditions, standards of attainment in subjects to be taught can be maintained.

easy matter to *establish standards of attainment in two or three subjects to be taught*, before students are allowed to present themselves to the world as "trained" teachers, rather than leaving this to the haphazard results of a general college course alone. The fact that a teacher may not be called upon to teach these two or three subjects does not alter the responsibility of the training institution; it increases that responsibility, for such institutions should so fit teachers that it would be a very absurd matter to expect them to try to teach *anything*—which is the condition they are in, if they have a few credits in a wide range of subjects, and little or no mastery of any.

4. *Credits in Semester-Hours in Education Before Allowed to do Practice Teaching*

	Min.	Max.	Median	A. D.	Freq. (No. of institutions)
Minimum required.....	3	27	10	3.3	82
Maximum obtained.....	6	40	17	5.7	62
Average obtained.....	5.5	27	12	3.6	54

The percentages of the institutions replying represented are as follows: minimum required, 39 per cent; maximum obtained, 30 per cent; average obtained, 25.5 per cent. But 27.5 per cent. of these institutions reported requirements of minima of credits in subjects to be taught, as against 39 per cent. which require a median credit of 10 hours in pedagogical courses. Again, the median minimal requirement of credit in the subject to be taught is 12 semester hours, while the required minimal credits in courses in education amount to a median of 10 semester hours. It would seem that institutions for training secondary teachers are open to the criticism of the opponents of teacher-training that they neglect training in content. The median of the maxima obtained is 17 semester hours. This seems to be a possible standard of attainment in all types of institutions and at the same time gives scope for such a variety of courses that the work of educational psychology, general principles of method, observation and practice teaching can be included in the 17 hours, and a possible leeway left for some other type of course. Again, the standard of 17 hours in 120 semester hours

required for a baccalaureate degree makes possible a distribution of the other college work so that groupings of 12-18 credits may be obtained in each of two or more subjects to be taught, in addition to a fairly wide range of choice for general educational courses in other fields of knowledge. The maxima are too high for acceptance, in either case, as standards to be applied to all, unless very radical re-adjustments are made in the organization of present college and university curricula.

5. *Types of Courses in Education Required as Prerequisites to Practice Teaching and Quantity of Credit Required in Each*

Type of Course	Min.	Max.	Median	A. D.	Frequency
Principles of Teaching in Secondary Schools.....	$\frac{2}{3}$	12	3	.48	76 institutions
General Psychology.....	2	8	3	1.1	72 "
History of Education.....	1	13	3	1.08	72 "
Educational Psychology.....	$\frac{2}{3}$	9	3	.74	68 "
Principles (or Philosophy) of Education.....	$\frac{2}{3}$	8	3	.62	54 "
Special Methods in one Subject..	$\frac{2}{3}$	8	3	.94	54 "
Observation in Secondary Schools.....	$\frac{1}{2}$	5	2	.84	34 "
Administration of Secondary Education	1	6	3	.77	29 "
Special Methods in all Subjects Taught.....	2	9	3	1.25	24 "
Social Phases of Education.....	1	6	2.5	.93	15 "
Other Types of Courses.....	1	10	4	2.25	14 "

General psychology, though not a course in education, was listed in the questionnaire under that heading to insure some discrimination between it and a course in educational psychology.

Other prerequisite courses are varied in name at least and surely in content to some extent. Antioch College reports ethics (3 hr.), sociology (6 hr.), and Bible (2 hr.). Purdue requires 3 hours of child study. This probably means slightly more than an amplification of some phases given by other institutions under other names, or even under the same name. Hiram College requires 4 hours of ethics and 6 hours of philosophy. Bradley Institute has a requirement of 10 hours evenly distributed among history, organization, and administration of manual art. Morgan College reports "ethics, school law, etc.," leaving us to guess the meaning of "etc." Western College for women specifies 1 hour given to the psychological principles underlying study. Oberlin specifies 3 hours in school administration, evidently a course of an

introductory nature to administrative conditions of education. Highland Park College has a requirement of 7 hours divided evenly between school and class management and school hygiene. Cincinnati reports "School Economy," 3 hours. Teachers' College (Columbia) requires 60 class hours in each of two content subjects; Oregon Agricultural College, 2 hours in history and theory of vocational education and 2 hours in vocational guidance; Miami University, 3 hours of psychology of adolescence; Baldwin-Wallace, genetic and experimental psychology, 2 hours each, and 1 hour of Ohio School Laws; Vermont, genetic psychology and philosophy of education; Montana, 2 hours in school hygiene; and Hunter College, 3 hours of logic.

These data reveal the following important tendencies:

(1) To require work dealing with the actual principles of teaching in secondary schools. This is as it evidently should be. But it should be noted also that only 72 institutions out of 111 report such a prerequisite. It seems wise, then, for this report to urge that more institutions make this work a prerequisite to entrance on practice teaching.

(2) Quite generally to require general psychology. This type of work has a theoretical justification. To acquaint the prospective teacher with the elementary facts concerning the mental life may be considered an elemental need; but the facts brought to light by Hall-Quest about the nature of this work raise a serious question as to the validity of making it a prerequisite. If it is to be a repetition of the older faculty theory of psychology (and it is so in many cases), then it becomes a hindrance to the prospective teacher rather than a help, and any work done later in present-day educational psychology must give considerable time to correcting erroneous theories included in the faculty psychology. This report recommends that departments and schools of education make investigation to learn if the condition just mentioned exists and to adjust it so that prospective teachers do not waste their time by such work. Departments of education can eliminate the requirement and give enough general psychology together with educational psychology in a total of 5 to 7 semester hours to avoid this difficulty.

(3) To require educational psychology. Surely this subject

ought to be a prerequisite. Yet but 72 out of 111 institutions require it. Some of the same work is included in courses bearing other names, such as principles of teaching, teaching process, conduct of recitation, general method. This field, so rapidly developing, surely ought to be utilized to its fullest possibilities in training prospective teachers. Yet much the same criticism may be made of it as of the work in general psychology.* Often it consists of general psychology cast in the vocabulary of the old faculty theory, together with some implications concerning the learning processes, and ignoring the large body of experimental data collected in such a work as Thorndike's epoch-making text on that subject. To make this work most valuable requires skill in interpretation of data and skill in indicating applications to the work of the teacher, both of which come only by work most carefully done. This report recommends the retention of educational psychology as a prerequisite to practice teaching, but only when it is not encumbered with the traditional theory of the old faculty psychology.

(4) To require history of education as a prerequisite. Again, a serious question is raised by such a requirement. Admittedly, this is a subject which does not provide a maximum of actual applications to the immediate work of the teacher in the school. It is also admitted that it is a difficult subject to teach so that it functions in the work of education in any way. Again, this subject is very frequently taught by the beginner in the instruction group, often inexperienced, and not having very adequate conceptions of the functions of the subject, except to have the students acquire vast quantities of historical data, undigested and without meaning in present educational conditions. Because of these actual conditions, this report urges that this subject be elective so far as it concerns the *immediate preparation for practice teaching*.

(5) To require principles of education. The present status of this type of work varies much. As conceived by the writer of this paper, it should perform as its major function the organiza-

*Readers may find illustrations in two reports by committees of the American Psychological Association, one in *Psychological Monograph* No. 51, April, 1910 (Report of the Committee of the American Psychological Association on the Teaching of Psychology), the other the Report of the Committee on the Academic Status of Psychology, December, 1914.—*Editor*.

tion and integration of the teacher's, or administrator's educational theory. As such, it should not precede practice teaching but either parallel it or follow it. While it should be required for all teachers and administrators, it should not be a prerequisite to practice teaching. Practice teaching should furnish data to help do the work in this field.

(6) To require the special methodology of one subject. This prerequisite presents some difficult problems. First, some fields have not developed the methodology in terms of present educational principles. Second, some fields lack much in either present, or traditional educational principles. Third, some institutions do not have, and cannot secure instructors qualified to give the wide variety of such courses needed. The persons trained for such work do not exist in large numbers. Fourth, these courses often negative by their influence the desirable training effected in courses given by the staff of the department, or school of education. On the other hand, it is highly desirable that such courses be utilized when well-trained persons can give them and cooperate with the staff in education. This report recommends that the work of these courses be left to the discretion of the department, or school of education, the staff requiring such work, if it can do so without injury, otherwise making it elective, or omitting it entirely. In its place, the work of principles of teaching in secondary schools can be elaborated and individual students can do more work in specializing in the applications of principles of teaching their special subjects.

(7) There is a rather weak tendency to require observation of the work done by secondary-school teachers as a prerequisite to practice teaching. The writer well recognizes the great difficulties of administering this type of work in order to make it function in the work of the teacher. Yet, it has such great possibilities, when well administered, that any teacher who begins the work of practice teaching without it will be handicapped. It presents problems of securing facilities that are of value, facilities that can be administered for the needs of both pupils and teachers, and many detailed difficulties. In spite of all these, this report recommends that such work be made a prerequisite to practice teaching, that it be used also while the practice teacher is at work, and that it be

used after the period of practice work. It also urges that teacher-training institutions take up this problem seriously and develop facilities sufficient to do this very necessary work. Further, it recommends that state legislation be enacted making it possible for all state-recognized teacher-training institutions to secure such facilities as they are needed, subject to the ratification of the state department of public instruction. Only 34 institutions out of 111 report such a prerequisite! *All* should require it.

(8) Less than one third make administrative conditions a prerequisite to practice teaching. Yet there is a type of work, frequently regarded as administrative, which is immediately helpful to the teacher, and which, if not given in some other course as a prerequisite, should be included in work in administration. It is sometimes listed as "School Economy," and deals with the practices needed to keep the schoolroom in decent condition as to the health of teacher and pupils, the organization of classes, the keeping of records and making reports, and the relations between teacher and administrative officials. It is recommended that such work be included in either a course in administration as a prerequisite, or required in some other course. Probably the appropriate place for it would be in the course on the principles of teaching in secondary schools.

It is further observable that the general tendency is to make all of the generally required courses three semester hours in quantity. Including these courses alone, the total work required would be 18 semester-hours. This includes the first six courses listed in the table of data. If to this we add observation and practice teaching, as formerly recommended by the committee (2.5 to 5 semester-hours), the total will be 20-25 semester-hours of work in general psychology and education. This makes a total too high for the present possibilities of most institutions, but one very desirable. It should probably be regarded as a maximum towards which institutions might develop. Again, some of the maxima are so high that they raise questions as to the justice of such requirements: for example, the 12 hours in principles of teaching and the 13 hours in history of education.

6. *Nature of Observation Work Required as a Prerequisite to Practice Teaching*

	Min.	Max.	Median	A. D.	Frequency
Min. No. of actual visits to class required.....	1	90	19	11.9	36 institutions
Min. No. of actual conferences required.....	1	36	11	7.2	30 "
Distribution of observations:					
Previous to P. T.....	1	36	10	7.7	30 "
Parallel with P. T.....	1	45	13.5	9.5	22 "
No. concerned with general principles.....	0.5	30	10	6.5	20 "
No. concerned with subject taught.....	0.5	40	11	8.9	18 "

Such tendencies as are observable from these data show that about 20 class visits of observation are made. These are about equally divided between "previous to practice" and "parallel with practice." They are also about evenly divided between the study of general principles and the study of the specific subject to be taught by the practice teacher. In another place in this study, data are given showing that 54, or 48.6 per cent. of the reporting institutions use parallel observations, whereas but 22 are reported under this item here. The writer is inclined to believe that 54 is nearer the truth than 22. This type of work, to the writer's personal knowledge, is very frequently given. This larger number taken as the more accurate would invalidate the use of 13.5 as the median number, and 45, as the maximal number of observations made in parallel.

7. *Scholastic Rank, or Grade, Required*

Specific Scholastic Requirements.

In general college work.

15 institutions require a grade of 60 or better.

19 institutions require a grade of D, or better.

14 institutions require a grade of passing.

19 institutions have miscellaneous requirements.

Total 67, or 60 per cent. of reporting institutions.

In subject to be taught.

13 institutions require a grade of 70, or better.

17 institutions require a grade of D, or better.

12 institutions require a grade of passing.

17 institutions have miscellaneous requirements.

Total 59, or 53 per cent. of reporting institutions.

In prerequisite courses in Education.

12 institutions require a grade of 70, or better.

17 institutions require a grade of D, or better.

14 institutions require a grade of passing.

15 institutions have miscellaneous requirements.

Total 58, or 52 per cent. of reporting institutions.

It is observable that there is a fairly strong tendency to insist upon some standard quality of preparation before entrance into practice teaching. In fact, it is probable that *all* institutions make some attempt at this, although but 60 per cent. of those reporting state that they do. In view of the fact that here is a very high correlation between teaching efficiency and quality of preparation, it seems odd that this item is not emphasized more. While those institutions that have specific requirements state them in terms of a percentage, a letter grade, or passing, it is probably true that all three groups really have but one minimum—that quality which someone judges to be “passing.” The miscellaneous statements of standards are given as follows: “good scholarship;” “good;” “average;” “excellent;” “satisfactory;” “approved by departmental teachers;” “high standing;” “must rank with highest one third of students;” “creditable;” “very high;” “average of 2;” “grade considered in recommendation.”

It is the opinion of the writer that a quality determined by judgments of relative position is probably most reliable. Hence, the standard of ranking with the highest one third seems a workable plan, although there might be marked differences of opinion about limiting it to one third.

8. *Requirement as to Physical Status of Practice Teacher*

Only a few institutions reported specific regulations bearing upon this matter. About 34 per cent., or 38 of the institutions reporting, take the physical status into consideration when selecting the practice teacher. About 45 per cent., or 50 institutions, report that they do not take this factor into consideration. Pittsburgh requires a physician's health certificate. The University of

Wisconsin requires a medical examination. Ohio Wesleyan requires a condition of good health based upon the health examinations of the Department of Physical Education, the head of which is a physician. No other specific regulations were reported. Of course, many colleges and universities have a general requirement of a certain quantity of physical training, but that is no more germane to the teaching profession than to the medical profession. Such work as has been done by Terman (*Health of the School Child* and *The Teacher's Health*) gives a basis such that almost any institution can do something, even though facilities are limited. This is, let it be said, an important part of the selection of the teaching staff, and it is to be regretted that so few institutions are seriously doing anything with it.

9. Requirement as to Moral Status of Practice Teacher

	Number	Per Cent. of all Reporting Institutions
Reporting a requirement.....	59	53
Reporting no requirement.....	36	32

A greater number have a requirement concerning moral status than concerning physical status. These requirements are usually stated as follows: "good character," "unusually strong," "requirements for college entrance." Others bar those who use liquor, tobacco, or profanity. Some few require written recommendations concerning moral character. In spite of these meager data, the writer believes that practically all institutions give this matter some oversight, neglecting it, probably, except in the flagrant, and easily observable cases.

10. Apprentice Work Required Preliminary to Practice Teaching

Type of Work	Frequencies and Percentages of Institutions Reporting			
	Yes	Per Cents	No	Per Cents
Keeping records.....	24	21.5	64	57.6
Making reports.....	31	28	58	52
Regulating room conditions.....	30	27	59	54
Regulating pupil conditions.....	23	20.7	61	55
Seating and organizing class.....	26	23.4	59	54
Other features of school-room management.....	28	25	59	54
Averages.....		24.2		54

Approximately one fourth require some form of preliminary apprentice work; approximately three fifths require no preliminary apprentice work. It would seem a better plan to induct the teacher gradually into the work of teaching than to do otherwise. The use of some form of preliminary apprentice work makes this a gradual change, and prevents loss of time after the teacher begins, as well as gives the practice teacher greater freedom to work with more important problems. The writer recommends that institutions make use of some forms of preliminary apprentice work before placing the teacher in charge of the class.

11. Who Sanctions the Selection of the Practice Teacher?

Person Sanctioning	Frequency	
	Yes	No
Head of department, or school	74	7
Instructor in education	29	26
Principal of training school.....	36	22
Regular teacher.....	14	28
Superintendent of schools.....	27	28
Board of education.....	5	41
President of college.....	11	38
Head of collegiate department.....	35	24
Instructor in collegiate department.....	13	29
Other persons.....	13	10

While these data reveal some tendencies regarding the sanction of the selection, they do not reveal all. For example, they do not show how these different agencies work jointly in the selection of the teacher. Such joint sanctioning appears in the following types of combinations: professor of education, professor in collegiate department, and principal of training school; head of department of education, president of college, and collegiate department; head of department of education, superintendent of schools, collegiate department; professor of education and principal of training school, and several others. As the table shows, the *department of education* is the predominant factor in the sanctioning of the selection of the practice teacher; but this is not a condition that is universal. Next, stands the *principal of the training school*. Third, in importance is the *collegiate department* that teaches the subject to be taught by the practice teacher.

As long as the department of education must be responsible for the professional training of the teacher, the final sanction of the

selection of the practice teacher should be in the hands of that department. Never should the collegiate department have final sanction in this matter. The department of education will, however, find itself frequently handicapped if it does not seek the cooperation of the collegiate department representing the subject to be taught. The peculiar variations in methods of selection shown here are due largely to very variable standards in the different institutions doing the work. For example, a small college may utilize a practice teacher to assist in the regular work of a teaching assistant, in which case the president of the institution may make the final selection of the teacher, but may rely very much upon the judgment of other parties, particularly of the two departments concerned. Again, a public board of education may employ a practice teacher as an assistant teacher, in which case the board will probably exercise the function of final sanction of that teacher.

In the larger universities, it will be necessary to have the selection exercised almost entirely, if not entirely by members of the college or school of education, otherwise the machinery becomes so complicated that it occupies too much time and labor in its operation. If two or three of these factors must operate together in a large university, it would often take a full semester to ascertain whether a prospective practice teacher could do any teaching. There is also the opportunity to eliminate many of the peculiar judgments made by men from collegiate departments as to the promise of teaching ability of the applicant. At the same time, it places very great responsibility upon the teachers and administrators of the schools and colleges of education. Whenever the institution maintains a training school of its own, and whenever it has cooperative relationships with public or private high schools it will be necessary to cooperate with the head of such school, and often with the regular teacher, in making final the selection of the practice teacher. In institutions in which the regular teacher in the training school is also a member of the faculty of the college, or school of education, it is evident that this person should have large power in the final selection of any practice teacher for his particular field.

12. *Requirement of Ability to Use Apparatus*

No. of institutions requiring	43
No. of institutions not requiring	40

Here there is no well-defined tendency to make such a requirement. There seems to be no definite tendency as to the type of institution that does make this requirement. All classes of institutions are represented in the number with the requirement, and the same may be said of those without it.

The type of condition required is variously stated. The following are some examples: "Yes, if in science;" "Must be able to do the thing to be taught to the pupils;" "In laboratory courses;" "Yes, if apparatus is to be used in the subject to be taught;" "Yes, experience in college laboratory;" "Yes, determined by personal acquaintance;" "Yes, satisfactory to department involved;" "Yes, all apparatus in physical education;" "To satisfy professor, if apparatus is a feature of the work;" "One weekly laboratory in special methods;" "Yes, to warrant excellent work;" "Suitable recommendation by department."

13. *Tests Used in Selection of Practice Teachers*

	Yes	No
Standardized tests	6	70
Practical teaching test	18	61
Other tests	6	11

It is very evident that, as yet, practically no use is made of any form of test to assist in selecting practice teachers. It seems wise that more experimentation should be done in this phase of selection of practice teachers. It is a possible conception that standardized tests of ability in schoolroom subjects may be used to help select such teachers. It is also possible to conceive of the use of a few periods of teaching as a preliminary test (practical teaching test) to assist in this matter. Such a test is now required by the State Law of Ohio for a part of the examination for county teachers' certificates, but it is not being carried out in all cases.

Dr. C. E. Holley made some preliminary tests of an experimental sort to help select practice teachers at Ohio Wesleyan University, in 1915-16. His results were almost negative, but the data

were few in number, and were compared with subjective judgments. Hence, the present writer does not believe that these data should be accepted as final.*

While six institutions report that they use some other tests, they do not indicate what the tests are. Hence, we are left in doubt as to what they are doing. It seems needful that serious students of education should consider this problem of great importance, and that they make experiments with it. It could be easily done, for almost all of the 111 institutions giving practice teaching have facilities to do the work, and there is surely need that it be done. It will help to substitute tested and exact data for subjective data about which there is always a chance for great variance of opinion.

14. Requirement of Writing Ability

Type of Institution	Yes	No
Municipal.....	1	2
Non-State Universities.....	1	7
State Agricultural Colleges.....	0	3
State Universities.....	1	14
Colleges.....	7	22
Totals.....	10	48

Five institutions require "Legibility," but do not state how it is determined. Three require a quality of "Good," but do not define what is meant. One non-state institution reports: "Considered in exceptional cases only." A state agricultural college states: "None specified, but constant pressure for better writing." One college requires a quality "equal to county certificate requirements."

Some requirement as to writing ability should be made. Here it is possible to establish a definite standard, for the Thorndike scale, or some other scale, can be used to ascertain the quality. A quality of 30 on the Ayres scale for children, or probably 40 should, in the writer's opinion, be the minimum for teachers in general. For teachers that will have much to do with handwriting, a much better quality should be required.

*See A. R. Mead and C. E. Holley, Forecasting success in practice teaching. *Jour. Educ. Psych.*, 7:1916, 495-497.

B. PRACTICES IN SUPERVISION OF PRACTICE TEACHERS

1 and 2. Selection and Organization of Content to be Taught

	Yes	No
By practice teacher.....	55	19
By some other person.....	72	6
By following texts used.....	77	6
By use of syllabi.....	64	10
Other methods.....	37	..

Various combinations of the methods indicated are used. But the data above show plainly the dominance of the textbook. They suggest that professors of education should say no more about the textbook method dominating school work until their own work is more free from it than this report indicates. On the other hand, it is encouraging to observe that syllabi are rather extensively used. This, of course, is not a guarantee of high-grade work, but it gives more chances of it than the following of a textbook. It should also be noted that 19 institutions take the selection and organization of content out of the hands of the practice teacher. This raises the query as to when these teachers will ever get training in doing this very necessary work, if not during the period of practice teaching. From the returns it seems that the commonest tendency is that the supervisor and practice teacher cooperate in selection and organization of content. To the writer, a type of cooperation between the two seems most advisable, because it gives the practice teacher some training in this, and at the same time, protects the work from erratic changes. The "other methods" were not indicated.

The writer recommends that all practice teachers be required to plan the entire course that they will teach, under supervision of their critic. This might be a part of some other course, or a part of the work of practice teaching, but it should be essentially a part of the practice teacher's training.

3. Planning of Daily Lessons

	Yes	No
By practice teacher.....	62	4
By supervisor.....	38	17
By both.....	63	5

Undoubtedly, the actual planning of the daily lesson should be done by the practice teacher and criticised by the supervisor. This

is probably the predominant practice, *i. e.*, “By both.” How can a supervisor justify the practice of planning the lesson to be taught? Would the supervisor desire that someone else plan her work for him or her? How will the practice teacher ever acquire any skill in planning his, or her teaching, if it is planned by the supervisor? Certainly, this practice should be discontinued. When the two work together, and the planning gradually becomes the work of the practice teacher, so that it is done without the help of the supervisor, the practice teacher is receiving valuable training.

4. *Supervisor’s Visits to the Class Taught*

	Freq.	Min.	Median	Max.	A. D.	Miscel.
Partial periods.....	32	2	13	80	10.3	27
Whole periods.....	27	2	9	48	8.1	17

Some reports gave data that could not be classified under the statistical headings; these are listed as miscellaneous. The general tendencies are important. To visit a practice teacher 13 partial periods, or 9 whole periods, is the prevailing tendency, according to these reports. Two very important problems are involved. First, should visits during but a part of the period be made for the purpose of supervision? Second, how many visits constitute a desirable standard? To the first, the answer can be very readily made that no one can judge the quality of a teacher’s work unless he sees and hears the teacher begin the work, carry it on during the period, and finish the period. How can a supervisor tell about summaries, assignments, aims, etc., by a judgment based upon the observations made during a visit of a few minutes to the class?

The second question cannot be answered so easily. It is a matter which will vary much with the needs of the practice teacher. One might secure the most important values of the training by a dozen visits and conferences, and another might do it in a half a dozen periods. However, it seems that as a matter of protecting the work from neglect (and the writer knows that it is sometimes neglected) some minimal standard number of visitation periods should be established. This might be stated better in terms of a proportion of the total periods taught by the practice teacher. The writer

suggests the following tentative and protective standards: for teachers who teach one class one period a day for a full semester, the supervisor should visit the class at least two fifths of the number of periods that the practice teacher has charge of the class; when the total teaching period is less than a semester, this proportion should be increased, because the same problems arise and the need is greater when the time is shorter. For the full semester's schedule, this would mean two visits per week by the supervisor.

5. *Determining Aims of Course and Daily Work of Practice Teacher*

	Yes	No
By practice teacher.....	60	16
By supervisor.....	71	8

Many reports revealed the fact that the aims were determined jointly by the supervisor and the practice teacher. Yet many indicated that either the supervisor or practice teacher had the entire control over this important matter of the teaching. Here, again, it seems wise that the practice teacher should have training and help by the supervisor, until, by gradual changes he can do it entirely himself. He should also be given help in identifying relationships between types of aims desired and types of methods needed to secure them.

6 and 7. *Use of Reports About the Work*

Reporter	Daily		Weekly	
	Yes	No	Yes	No
Supervisor.....	24	46	29	38
Practice teacher.....	32	42	35	39

Practically all institutions use some form of final report upon the work of the practice teacher. The use of the other type is varied, as shown by the table above. For the purpose of a careful record of the progress made and problems met, it would seem wise to have careful, systematic reports made at the end of each period, *by some one*, and, if not then, at the end of each week at least. Yet, on the other hand, there is an added burden of considerable size by such a requirement. The writer suggests that a

fair, working compromise can be made by having reports by the supervisor after each visit and conference, and after other periods, reports of some standard form filed by the practice-teacher. This latter seems to be the practice at the University of Wisconsin High School. Some report schedules are given further on in this paper.

8. Types of Conferences Used

	Yes	No
General conference.....	66	13
Individual conference.....	80	2
Both types.....	75	5
Types of individual conferences		
Held before teaching period.....	29	2
Held after teaching period.....	42	0
Held both before and after.....	65	1

These data establish the following facts: first, that some form of conference is universally utilized; second, that the general tendency is to use both general and individual conferences; third, that another general tendency is to have conferences with the practice teacher both before and after the period of teaching for the day, or at least on some of the days.

9. Parallel Observation Work Required

	Yes	No
Parallel observations required.....	54	27
In the same subject.....	51	4
In other subjects.....	24	22
In the same school.....	35	8
In other schools.....	29	13

Number of Observations	Institutions
4-6	1
5	1
10	2
8-12	1
12	1
20	2
30	3

Indefinite number of observations. "One hour per day." "One hour per week." "One half-hour per week." "One lesson in three." "One lesson a month." "One semester." "Sometimes."

These data show the following tendencies: first, to require some observation work parallel with the practice teaching; second, to require such work in the subject the practice teacher is teaching

more frequently than otherwise; third, to use the same school and other schools about equally; fourth, there is no marked tendency as to the quantity of this work done. This type of work is usually desirable. It may be desirable under any of the conditions stated above, yet some institutions neglect it entirely. It seems wise here that as a tentative, protective standard some number of parallel observations be established. Again, this standard may be established in terms of a proportion of the total number of class periods taught by the practice teacher. The writer suggests that this *proportion be not less than one tenth.*

10. *Methods of Rating Work of Practice Teachers*

	Yes
By letter-grade system.....	63
By percentage system.....	23
By some point system.....	11
By analytical, or score-card method.....	24
Other methods.....	12

These data show: first, a tendency to use some system of rating practice teachers; second, a tendency to use the letter-grade system more than any other, *i.e.*, the institution simply rates the teacher by the regular college grading system; third, that the percentage system is still widely used; fourth, that a point system of any kind is not widely used; fifth, that score-card methods are coming to be used rather widely. Some of the score-card blanks are exhibited in this chapter. This problem of rating is, of course, one of very great difficulty. The writer suggests that relative-position judgments of the work of the practice teachers may sometimes be used though these are often difficult to use because so few teachers will be at work at the same time. For consideration of this, the reader should consult the recent literature on teacher rating or teacher measurement.

11. *Who Supervises the Practice Teaching*

	Yes
A general director.....	71
Special supervisors	
On college staff.....	56
With public-school staff.....	36
With training-school staff.....	23
On college and high-school staffs.....	28

In almost every case one of these agencies is found working with one or more of the others. That is, the typical condition of supervision is that of more or less definite combination of supervising agencies. This raises several very important problems. Should there be a general director? If so, who should it be? If no general director, should not each supervisor be free to act alone without interference from others? It seems to the writer that, in general, the department, or school, of education should always hold the final power of supervision. This implies the existence of some sort of general director. As far as possible, all of the supervision should be conducted by the staff in education, or by them and their co-workers in the training school. The actual conditions of supervision are none too promising. In one institution, one hundred practice teachers are reported as supervised by one general supervisor with little or no additional help. It is the writer's view that this is the most crucial problem of the administration of practice teaching, in its present status. *To secure sufficient supervisory staff, with training to do the work, is now an impossibility, because such supervisors do not exist.* This means that departmental staffs are overworked, or they neglect this phase of teacher training, if they try to do all the work alone. Or, if they rely upon the help of other departments, they invariably have co-workers whose traditional training and educational theories are at variance with present educational theory, *and the very problem set for solving by the workers in education is very largely unsolved after all, because all that has been done by the department is negatived by the supervision of the practice teaching.* The writer makes the following recommendations regarding this practice: first, that all colleges and schools of education follow the policy of securing supervisors with experience and training in education. Second, that colleges of arts and sciences that are doing this work do the same thing just as rapidly as possible, and eliminate the supervision by other departments as rapidly as possible. Third, that any institution that is doing this work and cannot get the type of help needed, secure supervisors from the staffs of the best secondary schools and give them training along with the supervision. This is a possibility. There are often efficient teachers desirous of further train-

ing that can complete some graduate work this way, and the supervision they do and the remuneration for it serve the function of a teaching fellowship. *In general, any plan should be used which will eliminate supervision by the traditional sort of supervisor and which will bring the work of practice teaching into harmony with present educational philosophy and needs of secondary schools.*

12 and 13. Number of Practice Teachers Supervised

	Freq.	Min.	Median	Max.	A. D.
A. By the General Director					
Estimated.....	62	0	10	155	14.8
Computed.....	19	5	15	80	11.6
B. By Special Supervisor.					
Minimum.....	48	0	3.5	70	5.7
Maximum.....	45	2	12.	90	11.3
Average					
Estimated.....	23	3	6	42	6.69
Computed.....	9	1.3	6	35	7.3

These data show: first, that the majority of institutions are giving both the general director and the special supervisor a heavy load of work, *because this is so frequently done in addition to other work*, and because the maximal numbers are too large for any one person to supervise, even if no other work were done. The data verify what was stated above about the work of the supervisor. Second, the median tendencies are probably what they should be. The Society of College Teachers of Education, at the meeting held at Kansas City, in 1917, recommended a standard for the number of practice teachers supervised by one supervisor, or director. This standard was: "Not more than twenty practice teachers." In fact, this standard is far too high for efficient work by a special supervisor, as was well brought out at the Kansas City meeting by Dean H. C. Minnich, of Miami University.

14. Time in Clock Hours per Week per Practice Teacher Given to Supervision by Special Supervisor

	Freq.	Min.	Median	Max.	A. D.
Minimum.....	32	0.5	2.0	10	1.6
Maximum.....	29	1.0	5.0	15	2.1
Average.....	19	1.0	2.5	15	1.5

These data show: first, that the tendency is to give from 2 to 5 hours per week to supervision of an individual practice teacher; second, that to supervise some teachers takes very much more time than others, or the supervisors neglect the work for various causes in some cases; third, that it is left very doubtful what is being done in the other institutions which did not answer this query. Only about one third replied to this part of the inquiry.

15. *Distribution of Year's Instruction of a Given Class*

	Freq.	Min.	Median	Max.	Mode	A. D.
Portion taught by						
Practice teacher.....	67	10	50	100	50	20.9
Regular teacher.....	60	0	50	90	50	20.5

The portions are given in percentages of the total work of the year.

These data show that the amount of teaching done by the practice teacher varies from 10 per cent. to 100 per cent. of the year's work in a given class; second, that the general tendency is decidedly to divide the work equally between the two types of teachers. This raises the question of the advisability of having any class taught the whole year by a practice teacher, and also the question as to what portion *should* be taught by the practice teacher. This latter question refers, of course, to a general standard, subject to exception in unusual cases, but to be applied to most cases without much, or any variance. For example, should the practice teacher use 50 per cent. of the time of the class or 30 per cent. or some other proportion? This type of standard should not be determined arbitrarily but should be determined on the basis of two sets of factors: first, how much of the teaching will be needed to secure the results desired by the work of practice teaching? And second, how much of the time of the class can be utilized by the practice teacher and yet do no injury to the pupils taught? The latter question will be considered first. If the amount of supervision recommended in this paper is actually given, and the exceptionally incompetent teacher is immediately removed from the charge of the class, it seems to the writer that many classes may be taught throughout an entire year by the *same* practice teacher without serious injury

to the work, and, in fact, can be taught so that the efficiency of the work constantly increases. The writer ventures the view that such teaching would be superior to probably 50 per cent. of the present teaching anyway. Yet this does not mean that *any* one desiring to do practice teaching should be given such a privilege. From the other view, that of the needs of the teacher, it seems that the aims, or outcomes, of the practice work should be the limiting factor. If it takes ten weeks to attain these, then ten weeks should be the minimum; if a whole year, then a whole year's teaching should be required of the teacher. Five semester-hours is not too great a quantity to ask, but it is too great a quantity for some institutions to secure now. The varying standard (2.5 to 5 semester-hours) adopted by the College Teachers of Education seems to be a wise working standard for the present. But the quantity should be increased whenever any supervisor recognizes the need of so doing.

16. Quantity of Practice Teaching Done by Each Practice Teacher

	Freq.	Min.	Median	Max.	A. D.
In 45-minute periods					
Minimum required.....	21	15	40	200	28.5
Maximum obtained.....	11	30	50	95	16.5
Average obtained.....	11	20	50	120	27.7
In 50-minute periods					
Minimum required.....	13	3½	36	72	12.8
Maximum obtained.....	10	3	50	100	27.9
Average obtained.....	6	6	38	90	24.8
	Min. Req.		Max. Ob.		Average
Other periods					
40-50 minute periods.....	36		..		60
55-minute periods.....	22		72		33
60-minute periods.....	51		115		47
90-minute periods.....	..		..		90

Frequencies of periods other than 45 or 50 minutes were small.

Certain characteristics of these data demand explanation and raise queries. The median is in no case above 50 periods. If 18 periods (45 minutes to 60 minutes) be counted as one semester-hour, then the *median* amount of teaching done is about 2 to 3 semester-hours. The variations from the median amount are very great. This should be so. No fixed maximal or minimal amount should be required of all. The maxima reveal some idiosyncracies. For example, one institution reports that it requires 200 45-minute periods of teaching, but does not give the maximum obtained. The

highest maximum obtained, on the other hand, reported by another institution, is 95 periods of 45 minutes, while another reports the maximum of 100 50-minute periods. Regarding minima, it is not clear why the minima for the 50-minute period should be so much lower than for the 45-minute period. One institution reports a period of 90 minutes and indicates that it is a period of combined supervised study and teaching. The actual amounts of teaching done, as shown here, show also the possibility of maintaining the *varying* flexible standard of 2.5 to 5 semester-hours of practice teaching.

17. *Distribution of Practice Teaching Among Subjects in Percents.*

	Freq.	Min.	Median	Max.	A. D.
Portion done in first subject.....	21	33	67	100	19.3
Portion done in second subject.....	16	3	33	50	11.2
Portion done in third subject.....	5	2	..	33	....
Contemporaneously.....		6 yes		2 no	
Consecutively.....		9 yes		1 no	

These data indicate that there is, as yet, no *strong* tendency to provide practice teaching in *different* subjects, either contemporaneously, or consecutively. Among those few institutions that do provide practice teaching in two subjects, the median tendencies are to have two thirds of the teaching in the first, and one third of the teaching in the second subject. It is noteworthy that five institutions report practice teaching in a third subject. In general, it is safe to assume that the practice teaching of prospective secondary teachers is done in but *one* subject. But is such a custom wise? Is it meeting the needs of the secondary teachers? The writer thinks not. The following facts are pertinent in this connection. First, the great majority of high-school teachers teach more than one subject. Second, if they receive practice teaching in but one subject, either they must *transfer* a very large amount of their training or they must go through the ancient blunders and mistakes of teachers in beginning to teach the subjects in which they have not had practice teaching. Suppose that the teacher is called upon to teach United States history and plane geometry—and such combinations are not uncommon. And, suppose that the practice teach-

ing was done entirely in history. The chances are slight that there will be much transfer of real skill to teaching the geometry. It may be argued that facilities cannot be supplied for so much practice teaching; but the need exists just the same. *Practice teaching should be supplied in at least two subjects, and as soon as possible, it should be required in at least two subjects.*

18. Cost of Supervision

The data asked for here were not given, presumably because they had not been computed by any of the institutions. However, some did give the cost of supervision in terms of the total or partial salary of the supervisors. The following table includes such data as were received:

	Freq.	Min.	Median	Max.	A. D.
Total salary	9	\$500	\$1250	\$2500	\$489
Partial salary	20	7.50	50	150	30

The most common practice, as shown here, is to count a portion of one's salary as expended for this work of supervision. This is explicable because many of the supervisors give part of their time to other work. The teacher of special methods in history may be the supervisor in history and also teach some other course in that field. Until institutions keep careful records of costs, in terms of students educated, we shall not be able to secure reliable data on a matter of this sort, because they cannot take the time to make the computations needed to give the data. Such data would be of considerable value. Institutions contemplating the inauguration of practice teaching ask "What will it cost?" There is no definite answer for any of the many systems in vogue. Hence, the interest lags and the matter goes by default or the department, or college, of education fights a lonely battle.

19. Exemption of Teachers-in-Training from Practice Teaching

- (1) On basis of previous teaching experience: 36 yes; 38 no.
- (2) Quantity used as basis for exemption.
 - A. High-school teaching:
 - 1. Teaching in high school to be one and one-half times the practice-teaching requirement.
 - 2. Eight months' teaching used as basis.

3. One year's experience is used as basis by six institutions.
 4. Basis, "One year, four hours per week."
 5. Basis, "One year, three hours per week."
 6. Two years' experience is used by three institutions.
 7. One institution counts two years' experience as one semester-hour.
 8. One institution counts three years' experience as one semester-hour.
 9. Two institutions use five years' experience, one of them counting the five years' experience equivalent to one-half year of practice teaching.
- B. Elementary-school teaching:
1. Ratio is that of two times as much teaching experience as practice teaching.
 2. One year of eight months.
 3. Two institutions make "one year equivalent to exemption."
 4. One institution uses a sliding scale of one to two years.
 5. One institution uses three years and makes it equivalent to two semester-hours.
 6. One uses five years for exemption.
 7. One makes one year equivalent to four semester-hours.
 8. One makes one year equivalent to three semester-hours.
- C. On basis of other factors:
- "Exemption when not enough classes to go round."
 - "Reduce amount upon classroom evidence of efficiency."
 - "Lack of accessible school."
 - "Practice for all for whom there are opportunities."
 - "Lack of adequate facilities."
 - "Exceptional service in standard school system."
 - "Each must teach at least five periods."
 - "Optional with student."
 - "Exempt all except candidates for B. S. in Education."

Some important questions are involved in the matter of exemption of experienced teachers. For example, are not some experienced teachers almost incapable of profiting by any training? Are not some of them capable and desirous of profiting by just such training as skillfully supervised practice teaching? Are not facilities at present too scarce to provide all prospective teachers with practice teaching? If some are not exempt, at present will not the schools have a shortage of teachers, even in normal times? Will not inspection of the classroom work of the experienced teacher serve as basis to judge if she *should* do practice teaching? The writer believes that for the present, we shall be compelled to resort to more or less exemption; but that when war conditions become normal again, the practice of exemption should be gradually, but surely discontinued. Such a policy will mean the provision of facilities for practice teaching on a scale not now in existence in any institution.

20. Credit for Practice Teaching

Toward B.A. or B.S. in Arts.....	28 yes	11 no
Toward degree in Education.....	16 yes	

Bases for Equating Practice Teaching for one Semester-Hour's Credit

	Freq.	Min.	Median	Max.
Number of 50-minute periods required.....	20	15	21	90
Number of 45-minute periods required.....	15	15	21	126
Number of 45-minute laboratory periods required.....	13	15	36	50
Number of 55-minute periods required.....	1	18	..	90
Number of 60-minute periods required.....	1	..	..	25

Bases for refusing or granting credit are various, but mostly center around two types of conditions. First, incompetence, as judged by the supervisor, is a basis for refusing credit. Second, success, as judged by the supervisors, is a basis for granting credit. A few institutions report the work in practice teaching as a "non-credit requirement." This is probably one way of saying that the Arts college has successfully avoided allowing credit for such work, yet offers the work.

On what sort of a basis could one be expected to teach 126 periods for one semester-hour credit? This might be answered variously. Yet, to the writer there are some conditions which jus-

tify as small an amount of credit as that for 126 periods. If the supervisor rarely visits the class, if conferences are rarely held, if the visits to the class are few in number and almost all partial periods, then, it seems to the writer that the work is probably not worth any more than one semester-hour. It is but little else than unsupervised teaching, and that is not efficient practice teaching. The other features of the table need no additional comment.

SUMMARY OF SURVEY

One hundred eleven, or 52 per cent. of the institutions reporting are giving practice teaching for secondary teachers. Since 1914-15 there has been a general tendency to increase the work in all types of institutions except colleges and non-state universities.

Methods of Selection of Practice Teachers

1. Practice teachers are selected from junior and senior classes, from the fifth year of combination courses and from graduate students. The major tendency is to select a senior—a fourth-year student.

2. The amount of general college work required preliminary to entrance on practice teaching varies from 10 semester-hours to 134 semester-hours. The general tendency is to require a minimum of 90 semester-hours.

3. The amount of work done in subjects to be taught varies as follows:

- (1) In one subject: from 12 to 26 semester-hours, with an average of 18 semester-hours.
- (2) In a second subject: from 12 to 18, with an average of 15 semester-hours.
- (3) In a third subject: from 12 to 15, semester-hours.

4. The amount of work required in education before entrance on practice teaching varies from 10 to 17 semester-hours, with an average of 12 semester-hours.

5. The types of courses most frequently required in education preliminary to entrance on practical teaching are:

General Psychology	3 Sem.-Hrs.	72 Institutions
Educational Psychology	3 Sem.-Hrs.	68 Institutions
Prin. of Teaching in Sec. Schools	3 Sem.-Hrs.	76 Institutions
History of Education	3 Sem.-Hrs.	72 Institutions
Special Methods	3 Sem.-Hrs.	54 Institutions
Prin. or Phil. of Educ.	3 Sem.-Hrs.	54 Institutions

About one third of the 111 institutions (34) require observation of teaching in secondary schools.

But 15 institutions require the study of the social aspects of education.

Miscellaneous types of courses are required by 14 institutions, averaging 4 semester-hours each. In this group of prerequisites are the following: ethics, sociology, Bible, philosophy, school law, school administration, educational hygiene, genetic and experimental psychology, logic.

6. The institutions utilizing observation as a prerequisite are tending to require a minimum of 19 visits with 11 conferences. About one half are done preliminary to actual teaching and one half parallel to the teaching. The same proportions are distributed between the study of general principles and the study of the teaching of the subject to be taught by the practice teacher.

7. In scholastic rank, or grade, of work, there is little agreement, due to the vague and unsettled conditions of educational measurement. In general college work, 67, or 60 per cent., of institutions have some form of requirement. Fifty-nine, or 53 per cent., have such requirements in the subject to be taught, and 58, or 52 per cent., have such requirements for work in education. These requirements are expressed in terms of percentage, letter-grades "passing," "good," and excellent."

8. The physical status of the prospective teacher is taken into consideration by 38, or about 34 per cent., of the institutions. Fifty, or 45 per cent., have no physical requirement.

9. Probably all consider the moral status of the prospective teacher, but only 59 of the 111 report that they do so. Though they state they have such a requirement, very few give the require-

ment. Thirty-six, or 32 per cent., report that they have no such requirement.

10. An average of 54 per cent. report that they have no preliminary apprentice work in keeping records, making reports, regulating hygienic conditions, nor class organization and management. An average of 27, or 24 per cent., report that they do require preliminary apprentice work in these phases of teacher activity. Keeping records is required least, and regulating room conditions is required most frequently.

11. The final sanction of the selection of the practice teacher is given by the head of the department or school of education in 74, or $66\frac{2}{3}$ per cent., of the institutions and in 7, or 6 per cent., he does not have this function. Other persons who help to select the teacher are the instructors in education, principal of the training school, regular class teacher, superintendent of schools, board of education, president of college, member of the collegiate department representing the subject to be taught. Boards of education have least to do with sanctioning selection. Others do this in the order given here; department of education, principal of training school, head of collegiate department and superintendent of schools.

12. Thirty, or 27 per cent., of the 111 institutions require some degree of skill in use of teaching apparatus; 23, or 20 per cent., have no such requirement.

13. The use of some form of test to aid in selection of teachers is reported as follows: 70, or 63 per cent., do not use any standardized tests; 6, or 5 per cent., report that they do use such tests. Eighteen, or 16 per cent., use a practical teaching test, and 61, or 55 per cent., do not. One institution reports experiments with some special tests.

14. Ability to write legible handwriting is considered by 10, or 9 per cent., and 48, or 43 per cent., do not consider it.

Practices in Supervision of Practice Teachers

1. The preliminary selection and organization of the subject matter to be taught is made by supervisor in 65 per cent. of the institutions, while in 50 per cent. the practice teacher either shares in this or does all of it. Seventeen per cent. of the institutions

state that the practice teacher does nothing with this type of work. Six institutions state that the practice teacher is given full freedom in his matter.

2. Seventy per cent. use texts as guides in content. Fifty-seven per cent. use syllabi as guides in content. Thirty-three and one third per cent. use other means.

3. In 56 per cent. of the institutions both practice teacher and supervisor cooperate in lesson planning. In 33 per cent. the supervisor dictates the plan. In 15 per cent. the supervisor does nothing with lesson planning.

4. The aims of the work are determined, according to the returns, by both supervisor and practice teacher. In 64 per cent. the supervisor and in 54 per cent. the teacher, share in determining aims. In 14 per cent. the teacher is not supposed to determine the aims of the work.

5. During the period of practice teaching, the supervisor tends to visit the classroom and inspect the teaching for 13 partial, and 9 whole periods. Since the number of periods of teaching tend to be about 36 to 50, the supervisor is in the classroom about 20 to 25 complete periods, and makes short visits to the room in about 25 per cent. to 36 per cent. of the periods of teaching.

6. About one fifth require *daily* reports by supervisor. About two fifths require *no daily* reports by supervisor. About 30 per cent. require *daily* reports by practice teacher. About 38 per cent. require *no daily* reports by practice teacher.

7. About 26 per cent. require weekly reports by supervisor. About 35 per cent. require no weekly reports by supervisor. About 31 per cent. require weekly reports by teacher. About 35 per cent. require no weekly reports by teacher. Practically all require some form of final report on work when teaching is completed.

8. Both general and individual conferences are used in 67 per cent. of the institutions. Individual conferences predominate; 72 per cent. use them. Eleven per cent. do *not* use general conferences.

Individual conferences are held both before and after the period of teaching in 58 per cent. of the cases. Conferences before teaching are least often used.

9. Parallel observation work is used by 47 per cent. of institutions; 26 per cent. state they do not use it. There is no general tendency as to the quantity of these parallel observations. Most of them concern the teaching of the subject taught by the practice teacher and are in the same school where the practice teacher is at work.

10. The most prevalent method of rating practice teachers is by letter grades. Analytical (score-card) method comes next and the percentage system third. Many combine letter grades with other systems.

11. The supervision is given by the following named persons, the order indicating their relative frequencies: general director, supervisor on college faculty, supervisor on staff of public school, supervisor connected with both institutions, and supervisor on staff of training school only. Sixty four per cent. report the use of a general director.

12. The number of practice teachers supervised by the general director varies from none to 155. The median tendency is to supervise about 10 to 15 teachers.

13. The number of practice teachers supervised by the special supervisor varies from none to 90, but the median tendency is about 4 to 12.

14. The time in clock hours per week per practice teacher given to supervision varies from 1 or 2 to 15 hours. The general tendency is about 2 to 5 hours.

15. The portion of the year's work of a given class taught by practice teachers varies from 10 to 100 per cent; by the regular teacher from none to 90 per cent. The prevailing tendency is to divide the work equally between the practice teacher and the regular teacher.

16. The class period in practice teaching varies from at least 45 minutes to 90 minutes. In 45-minute periods, the amount of teaching varies from 15 to 200 periods, with the median tendency about 40 to 50 periods. In 50-minute periods, the number taught varies from 3 to 100, the median tendency being about 36 to 50. Periods of other length vary from 22 to 115, the average being about 57 periods.

17. The general tendency is to have practice teaching done in but one subject. Amounts done in first and second subjects tend to be in the ratio of 2:1. Five institutions report teaching in a third subject. There is no marked tendency in doing the teaching in two subjects contemporaneously or consecutively.

18. The cost of supervision is reported in terms of salary rather than in terms of cost per practice teacher. Nine institutions report a median cost for supervisor's salary of \$1250.

19. Exemption from practice teaching for previous teaching experience is apparently used as frequently as non-exemption. The percentage of institutions granting such exemption is 32 and those without such exemptions 34. Nine institutions require a year's high-school experience as a basis for exemption. Four require two years' experience in the high school, one three years', and one five years'.

20. Practice teaching is quite generally credited for the bachelor's degree in arts, although a fair minority of institutions do not so credit it. Twenty-eight grant credit, and 11 do not. A semester-hour's credit is granted for about 21 45-minute or 50-minute periods, and for 36 45-minute laboratory periods.

FORMS OF REPORTS AND RATING SCHEDULES

Very few institutions submitted blanks which they used, but the material submitted is here given. Similar material is given for Chicago, California and Wisconsin in Bulletin 1917, No. 29, U. S. Bureau of Education, pages 43-62. The list here given includes the following institutions: Baldwin-Wallace College; Highland Park College; Indiana University; Iowa State University; Leland Stanford University; University of North Dakota; Ohio Wesleyan University; and College of William and Mary. Institutions which are establishing practice teaching will find helpful suggestions from these blanks.

BALDWIN-WALLACE COLLEGE, BEREA, OHIO

INSTRUCTOR'S LESSON PREPARATION

To be filled out before directing students' preparation.

Course	Textbook or Manual	Lesson	Date
Review of High Points			
New Thoughts			
Relation to Previous Work			
Parts for Special Attention			
Helpful References			
Aim			
Correlates			
Transfers			
Practical Applications			
Best Methods of Presenting This Lesson			

II

HIGHLAND PARK COLLEGE

TEACHER EFFICIENCY RECORD

		Very		Excel-
	Rating	Poor	Poor	Medium
		Good	lent	
<i>I. The Teacher</i>				
1. Personal qualities				
2. Intellectuality and insight				
3. Motive and spirit				
4. Professional preparation				
5. Initiative and self-reliance				
<i>II. The Study</i>				
6. Direction and stimulation of students				
7. Seat work inspection				
8. Cooperation and loyalty				
9. Individual help				
10. Interest and growth				
<i>III. The Class Recitation</i>				
11. Definiteness and clearness of aim				
12. Accuracy and detail of presentation				
13. Skill in questioning and illustrating				
14. Power to interest and hold attention				
15. Regard for observing, thinking, doing and expressing				
<i>IV. School Management</i>				
16. Hygienic conditions				
17. Disciplinary powers				
18. Regard for routine				

[Ruling omitted in reproduction]

19. General atmosphere of school

20. Care for the school plant

General Rating.....

Room.....Recorded by.....Date.....

III

INDIANA UNIVERSITY SCHOOL OF EDUCATION

PRACTICE TEACHER'S RECORD

Name

Date of completion of practice teaching

Date of Graduation

Degree

Major subject

No. semester hours

First minor subject

No. semester hours

Professional education courses, No. of hours

Average scholarship in all subjects

Major subject

education courses

Estimate of major department as to personality and general ability:
of education department:

Previous teaching experience in years: elementary schools
high schools

Last position (place)

(date)

Name of county or city superintendent

Success grade

Kind of license last held

, date of issue

First position after practice work (date and place) elementary school
High school

Estimate of success in this position 1, 2, 3, 4, 5, (check)

(See rating plan reverse side.) [No. IV]

Strong points

Weak points

Comments by critic:

IV

INDIANA UNIVERSITY
PRACTICE TEACHER'S RECORD

Subject..... Critic.....

Qualities of Merit

I. *Personality* (30 points) P 1 2 3 4 5 R 1 2 3 4 5 R 1 2 3 4 5 R

1. Personal appearance 2 [Rulings omitted in reproduction]

2. Adaptability—resourceful 3

3. Self-reliance—poise 3

4. Enthusiasm—optimism 4

5. Tact—sympathy 3

6. Sincerity—earnestness 2

7. Voice 1

8. Use of English 2

9. Industry 4

10. Intellectual capacity 4

11. Physical capacity 2

RATING

First Second Third
Six Weeks Six Weeks Six Weeks

II. *Teaching Skill* (45 points)

1. Range of information 3

2. Daily preparation of lesson 4

3. Use of method types 2

4. Sense of values 3

5. Skill in questioning 5

6. Attention and interest 2

7. Reaching individuals 2

8. Using pupil experiences 3

9. Keeping lesson organized 2

10. Economizing of time 3

11. Use of illustrative aids 2

12. Assignment of lesson 3

13. Application of knowledge 3

14. Motivation of work 3

15. Accuracy and incisive

thinking 3

16. Insistence on good English 2

III. *Management* (15 points)

1. Systematic routine 3

2. Promptness in reports, etc. 2

3. Appearance of room—atten-
tion to lighting and

seating 2

4. Discipline 4

5. Teacher's personal relation
to pupils 4

IV. *Professional Attitude*

(10 points)

- | | |
|---|---|
| 1. Professional growth and interest | 3 |
| 2. Loyalty and cooperation | 3 |
| 3. Attitude towards criticism | 2 |
| 4. Interest in pupils and school activities | 2 |

Total Rating	1st	2nd	3rd
--------------	-----	-----	-----

Explanation of Numbering—P indicates perfect score; 1, superior or perfect score; 2, above average or .9 of perfect score; 3, average or .8 of perfect score; 4, below average or .7 of perfect score; 5, unsatisfactory or .6 of perfect score; R, the actual rating in figures. The third rating will be the final term grade. To translate this rating into University rating, add 2 to a grade of 85 to 89; 5 to a grade of 75 to 84; and 2 to a grade of 70 to 74.

V

STATE UNIVERSITY OF IOWA

TEACHER'S RECORD

Teacher	Dates
Sections Noted	
I. <i>Purpose or Aim</i>	Accomplished?
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	[Ruling omitted in reproduction]
II. <i>Organization of Material</i>	
Did she assign problems?	
Did she have data grouped?	
Did she provide for correlation?	
Did she observe relative values?	
III. <i>Use of Knowledge</i>	
Did she emphasize quality?	
Did she test methods of work?	
Did she ask thought questions?	
Did she ask fact questions?	
Did she encourage good expression?	
IV. <i>Provision for Individuality</i>	
Did she use pupils' experiences?	
Did she use pupils' present interests?	

- Did she use text material only?
- Did she consider individual needs?
- Did she stimulate initiative?

V. The Recitation

- Was it socialized?
- Were the pupils prepared?
- Was cooperation demanded?
- Was freedom permitted?
- Was discussion encouraged?
- Was discussion directed?
- Incentives and motives
- Interest and attention
- Was the time properly divided?

VI. General Spirit

VII. Discipline

VIII. Is She a Leader?

- Is she vigorous?
- Is she pleasant?
- Is she resourceful?
- Is she sympathetic?
- Is she handicapped?

Dates of Conference with Teacher

VI

LELAND STANFORD JR. UNIVERSITY

The practice teacher is asked to rate himself a week before the end of the semester in which the teaching has been done. The special supervisor is also asked to rate the practice teacher on a separate sheet. The two ratings are then plotted as curves, in ink of different colors on another sheet which is kept as a record. A copy of the rating sheet follows.

SCORE SHEET FOR RATING OF PRACTICE TEACHERS

Name of practice teacher rated.....

(Place check mark or "X" in the one of five spaces following each specified trait, which most nearly represents your judgment of Practice Teacher's ability.)

Points for Rating

Degrees of Excellence

I. Preparation

- A. Personal Preparation, i.e. thoroughness of knowledge of subject
- B. Preparation of suitable material for adequate presentation of daily lessons

Poor Fair Good Very Good Excellent

[Rulings omitted in reproduction]

- C. Preparation of weekly or monthly lesson plans

II. Teaching Skill

- A. Ability to stimulate interest
- B. Ability to ask thought provoking questions
- C. Ability to carry on all work of the classroom with promptness and efficiency

III. School Management

- A. Ability to govern class (Self-control, firmness, tact)
- B. Ability to make necessary routine automatic
- C. Ability to adjust methods and materials to different types of pupil ability

IV. Personal Fitness

- A. Physical and mental poise
- B. Personal appearance (neatness, taste, etc.)
- C. Qualities of leadership (Executive capacity)

Signed.....

Official Position.....

Date.....

VII

SCHOOL OF EDUCATION, UNIVERSITY OF NORTH DAKOTA

PRACTICE TEACHING

Report by the Critic Teacher

For Student-Teacher

Subject Taught

Number of Lessons Observed by Student-Teacher.....Taught.....

Semester..... Year.....Date of This Report.....

Signed.....Critic-Teacher

A. Preparation of Lesson

[Spaces for record condensed in reproduction]

B. Skill in Conducting Recitations

C. Ability to Manage Pupils

D. Personal Fitness for Teaching

E. General Rating of Teaching

The points outlined below are considered in making these reports which describe definitely and in detail the characteristics of the student-teacher. It is not intended that the critic-teacher shall report on each point in every case, but he emphasizes those points that are especially significant for the particular student-teacher concerned. The critic also adds comments on any other notable aspects of the student's work.

(a) Preparation of Lessons—Accurate knowledge of subject matter; clearness of purpose; originality; appreciation of relative values; conciseness of statement; mechanics of plan-arrangement, writing, etc.

(b) Skill in conducting recitation—In exposition or telling; questioning; holding attention and interest; reaching individuals; using pupils' experiences and responses; keeping lessons organized; economizing time; securing and fixing definite results; using blackboard and other means of illustration; care of pupils' English; assigning study lessons; etc.

(c) Ability to manage pupils—General attitude—sympathetic or cold and formal; winning or antagonizing; systematizing and economizing routine; handling distracting or disturbing elements; maintaining authority; decision; consistency; etc.

(d) Personal fitness for teaching—Scholarship; industry; promptness; willingness; health; energy; animation; general culture; refinement; courtesy; confidence; poise; neatness; carriage; voice; enunciation; etc.

VIII.

OHIO WESLEYAN UNIVERSITY

Department of Education

SUPERVISOR'S REPORT ON STUDENT TEACHING

Directions.—Make two copies of the final report, filing one with the Appointment Committee and one with the Department of Education. Rate items by the point system. For the summary rating use either the average, median, or mode, as seems best. If any items cannot be rated, omit rating of them or briefly characterize them. Make a rating about every fifth period, and then the summary rating. Recent studies show that *Results* should be given heaviest

weighting, and *Technique of Teaching* next in importance. Under the heading *Miscellaneous* include anything not covered in previous headings, and yet of value to the report.

Data for all ratings should be obtained by observation of the work of the student-teacher for complete class periods, by investigation of ratings in quizzes and class work, by character of the pupils' written work, and by any behavior that indicates the reactions of the pupils to the teacher's work. Under "Classification of group taught" indicate whether a class in high school, or academy, etc.

It is of great value to place one of these blanks in the hands of the student-teacher with instructions that he, or she, rate the work. Thus used it becomes a teacher's estimate of his, or her own progress. It also insures unity of aims between student-teacher and supervisor.

Supervisor	Student-teacher
Subject taught	No. of class hours taught
Date of beginning	Date of completion
Size of class	No. of boys in class
No. of girls in class	Classification of group taught

I. Results of Work of Student-Teacher	Rating	Rating	Rating	Rating	Rating	Rating	Rating
1. Growth of pupils in							
(a) Subject-matter							
(b) Habits required							
(c) Interests							
(d) Ideals							
(e) Reflective thinking							
(f) Appreciation, or habits of enjoyment							
(g) Ability to study							
2. Fulness of pupils' recitations							
3. Pupils' manners and behavior							
4. Pupils' use of English							
5. Neatness of pupils' work							
6. Pupils' daily preparation							
7. Group activity in work of pupils							
8. All pupils busy during period							
II. Technique of Teaching							
1. Definiteness of aims							
2. Skill in questioning as to							
(a) Thought-stimulating questions							
(b) Memory questions							
(c) Wording of questions							
(d) Distribution of questions							
(e) Number of questions							

[Ruling omitted in reproduction]

3. Skill in

- (a) Use of texts.....
- (b) Use of apparatus.....
- (c) Drill work
- (d) Inductive method
- (e) Deductive method
- (f) Exposition
- (g) Conversational method
- (h) Use of reviews.....
- (i) Use of summaries.....
- (j) Securing work from all pupils
- (k) Management of individual
differences
- (l) Lesson-planning
- (m) Lesson assignment.....
- (n) Selection of content.....
- (o) Organization of content.....
- (p) Grading

III. Schoolroom Management

- 1. Lighting
- 2. Ventilation
- 3. Care of books and apparatus.....
- 4. Written work
- 5. Records and reports.....
- 6. Seating of pupils.....
- 7. Discipline

IV. Personal Facts About Teacher

- 1. Familiarity with subject.....
- 2. Physical status in class.....
- 3. Self-control
- 4. Faithfulness in daily preparation
- 5. Attitude towards work.....
- 6. Attitude towards supervisor.....

*V. Miscellaneous**VI. Summary Rating*

IX.

OHIO WESLEYAN UNIVERSITY

DEPARTMENT OF EDUCATION

DAILY REPORT OF STUDENT-TEACHERS

To be used by all student-teachers teaching outside of Delaware.

Give items 1-10 every day; others as they are represented in work.

1. Name 2. Subject.....3. Date.....
4. Location 5. Type of School.....
6. Size of Class: Total..... No. of Boys.....No. of Girls.....
7. Length of Class Period.....
8. Type of Period....Lab., Direct Instruction, Supervised Study.
(Underscore type represented)
9. Name of Supervisor.....
10. Was he or she present *all* or *part* of the Period?
11. Describe the *situation* in terms of *work assigned for day, aims to be attained, procedures used, use of texts and apparatus, conditions of room as to utility and hygiene, your own previous preparation, special individual differences among pupils.*
[Space for record condensed in reproduction.]
12. Describe the *responses (results)* in terms of *habits or skills initiated or fixed, information secured by pupils, interests aroused or increased, appreciative activities noted, use of thinking abilities, ideals initiated or strengthened, pupils' preparation, cooperative activity of class, use of English, neatness and orderliness of pupils' work, fullness of recitation, all busy during entire period.*

X.

OHIO WESLEYAN UNIVERSITY REPORT OF WORK OF STUDENT-TEACHER to DEPARTMENT OF EDUCATION*

1. Name of student-teacher:
2. Subject taught:
3. Date of teaching:
4. Type of School: High School; Junior High School; 7th. or 8th. Grade
5. Size of Class or Classes:
No. of Boys: No. of Girls:
6. Number of Periods Taught: Length of Periods:
No. of Periods visited by Supervisor:

*To be used when Supervisor is not a member of the Department of Education.

7. Rate following items as excellent, medium, or poor.

1. Assignments:
2. Methods:
3. Results of teaching:
4. Teacher's care of room and apparatus:
5. Schoolroom government:
6. Teacher's preparation:
7. Any miscellaneous items noted:
 - 1.
 - 2.
 - 3.
 - 4.

8. Name and position of person reporting:

XI.

COLLEGE OF WILLIAM AND MARY

DAILY CRITIC REPORT

(Filled out to show sample report.)

Student-teacher	Garland	, Grade	High School.
Subject	English Comp. I.	, Topic	Argument.
Type of lesson	Inductive		
Teacher's plan:	Preparation	A	, Quality B , Mastery B
Question: Form	B	, Placing	C , Continuity C
Personal bearing	A	, Self-possession	A
Preparation of materials		, Originality	A , "Snap" C
Control of class	B	Why?	
Pupils' attention	90 per cent.	, Why?	Had live interest to them—an unexpected argument in class.
Pupils' initiative	B	, Organization	
Habit training:	Language	C	, Study C , Posture C

ETHEL FRAZIER FURR, Critic.

Grade A for very good, B for fairly good, C for poor, and comment specifically whenever practicable.

Lesson was too slow for a good lesson.

CHAPTER V

PRACTICE TEACHING IN THE MANUAL ARTS AND INDUSTRIAL EDUCATION

FRED C. WHITCOMB
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The status of practice teaching in these subjects has received little attention. The report of the committee given below was an attempt to collect data on the subject. Owing to the failure of many institutions to respond to the questionnaire sent out, the report is not as complete and comprehensive as it should have been.

Because of the comparatively recent introduction of the manual and industrial arts into the curriculum of the schools, and further because of the fact that until quite recently it was thought that anyone could teach these subjects (often this was because trained teachers could not be obtained), their professional aspects have received little attention. More recently teachers' colleges and normal schools have been training teachers for the practical arts and gradually the professional side of these subjects has been developed. Practice teaching has received attention in these courses, but often it has been poorly organized and supervised. The subject matter of the courses in the manual and industrial arts as taught in elementary and secondary schools has not been organized and standardized as has the subject matter of the academic subjects.

As the demand for vocational education has developed during the last ten years, new aspects of the teacher-training problem in industrial education have arisen. The importance of practice teaching here is indicated in Bulletin No. 19 of the *National Society for the Promotion of Industrial Education*, which briefly says: "Practice of this kind (referring to practice teaching) is highly essential to the most efficient training."

A "Conference of Specialists in the Training of Teachers of Manual Arts and Industrial Education" is called annually by the United States Commissioner of Education. Invitations are extended to institutions in the Mississippi Valley which train teachers of manual arts and industrial education. The states included in this territory are: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Arkansas and Oklahoma.

At the meeting of this Conference in December, 1916, at the George Peabody College for the Training of Teachers, a committee was appointed to investigate the status of teacher training in the manual arts and industrial education in the United States. Through the office of the United States Commissioner of Education, this Committee sent out a questionnaire to the 100 institutions in the United States which are credited with training teachers of manual arts and industrial education. Only 25 replies were received.

A considerable part of this questionnaire had to do with observation and practice teaching. On this subject institutions were asked to report; first, on what they were now doing, and second, to suggest what they thought should be done. The results may be summarized as follows:

I. What is Now Being Done

1. Almost all institutions reporting require some observation and practice teaching.
2. Have facilities for practice teaching
 - (a) in model school, 32%
 - (b) in public school, 28%
 - (c) in model and public school, 20%
3. Practice teaching done under supervision of
 - (a) head of department, 36%
 - (b) critic teacher, 28%
 - (c) grade teacher, 8%
 - (d) combinations, 28%
4. General plan of work directed by
 - (a) head of department, 56%
 - (b) supervisor of practice, 8%
 - (c) city supervisor, 8%

- (d) instructors, 12%
- (e) combinations, 16%
- 5. Practice experience is given in
 - (a) woodwork, 13%
 - (b) woodwork and mechanical drawing, 46%
 - (c) woodwork, mechanical drawing and metal work, 17%
 - (d) academic subjects and technical work, 4%
 - (e) printing, 8%
 - (f) various combinations, 12%
- 6. Amount of time given to observation and practice teaching is extremely variable, ranging from 12 to 270 lessons. An average from normal schools reporting is 94 hours. Colleges report less time than normal schools.
- 7. Is previous teaching experience recognized as equivalent to practice teaching?
 - (a) "No" reported by 71%
 - (b) "Yes" by one school only.
 - (c) "In special cases," 12%
 - (d) Answers from other institutions not clear.

II. What Should be Done?

1. All favor some practice teaching under school conditions approximating those of the regular public schools.

2. Critical and fairly constant supervision of all practice teaching is essential.

3. Practice teaching should be done during the last year of the student-teacher's course.

4. Considerable variety of opinion as to size of classes most effective for practice teaching; majority favor 12 to 20 pupils.

5. Much variety of opinion as to amount of practice teaching to be required. The majority favor 75 to 100 clock-hours of actual teaching in a two-year course; little if any additional teaching is thought necessary in a three- or four-year course.

6. Observation, of a limited amount, if preceded and followed by conferences with critic teachers, is considered valuable and desirable.

Recommendations Made by the Committee

On the basis of these returns, the Committee that distributed the questionnaire has made the following recommendations concerning the training of teachers of the manual and industrial arts:

1. All student teachers in a manual arts or industrial education course should be required to have practice teaching, preceded by observation, both under expert supervision; classes should be

held under conditions approximating those found in the better grade of public schools.

2. Classes should be of sufficient size to provide good teaching conditions, with a suggested minimum of 10 pupils and maximum of 20.

3. The actual classroom work including observation, assisting and teaching should approximate 100 clock-hours, an equal amount of time being required in preparation for the class work and in conferences.

4. Practice should be required both with high-school and with grade classes—one assignment with each in different semesters or terms.

5. Practice teaching should be done during the last year of the student-teacher's course.

CHAPTER VI

NOTE ON THE CORRELATIONS BETWEEN GENERAL TEACHING POWER AND SOME SPECIFIC TEACH- ING QUALITIES

CHARLES FORDYCE

Dean of Teachers College, University of Nebraska

In the year 1916-17, the writer made a study of the correlation between "general teaching power" and the five principal qualities upon which student teachers are rated in the Teachers College Training School of the University of Nebraska. This training school is a high school accredited by the North Central Association of Colleges and Secondary Schools, and has been maintained for ten years by the University of Nebraska for the purpose of providing intending teachers an opportunity to do actual teaching in preparation for entering the teaching profession in the state. Each prospective teacher is required to teach during his senior year in his chosen subject or subjects in which he must have given forty University hours of special study.

The following are the correlations between "General Teaching Power" (G. T. P.) and the five specific qualities by which the 123 student teachers considered in this study were rated:

- | | |
|---------------------------------------|-----|
| 1. Personality and G. T. P..... | .59 |
| 2. General Scholarship and G. T. P... | .61 |
| 3. Major Subject and G. T. P..... | .70 |
| 4. Social Power and G. T. P..... | .75 |
| 5. Technique of Teaching and G.T.P.. | .79 |

1. "Personality" is used by our supervisors to include (a) general appearance, (b) vigor and buoyancy, (c) initiative, (d) poise and (e) tact.

2. "General scholarship" here includes not only academic but also professional achievement and is based upon semester grades on file at the office of the University registrar.

3. "Major Subject" includes the chosen subject on which the student has made special preparation for teaching and is here represented by the semester grades on file. It may be explained that we require each candidate to put forty hours of preparation on the subject, or a subject and one closely allied to it, that is to represent the field to be taught when he enters upon public-school teaching. This preparation includes a course in the special method of teaching this chosen subject.

4. "Social power" includes an understanding of human nature and the capacity on the part of the teacher to enter into the mental states of the student and to exercise that sympathy and directive power essential to encouraging students in their work; also loyalty to supervisors and other instructors on the teaching staff; and finally, ability to secure the cooperation of patrons.

5. "Technique of Teaching" includes (a) skill in assignment, (b) skill in showing pupils how to work, (c) skill in the selection and organization of subject matter, (d) ability to frame strong questions, (e) skill in illustration, (f) ability in drill work, (g) skill in class management.

6. "General Teaching Power" is determined by the average results of the ratings of three judges in the case of each student teacher. In each department there is a special supervisor who has direct charge of all student teachers teaching in his particular subject. This supervisor watches daily the results of each of his instructors and records his estimate of their general teaching ability. Further, the professor of Educational Theory and the principal of the demonstration school estimate the general teaching power of each teacher on the basis of a half dozen observations made during the semester. The ratings made by these three sets of judges are based on the 45 qualities embraced in Boyce's score card (*Fourteenth Yearbook*). The writer took as his basis of general merit the average of all of these judgments. The specific quality of technique of teaching was determined by these same judges, and

in a similar way, which doubtless accounts in a large degree for the high correlation.

Personality, Social Power and Technique of Teaching are each based on the combined judgments of the twelve supervisors of the training school (who are continually present with the student teachers), of the principal of this school and of the head of the Department of Educational Theory and Practice.

CHAPTER VII

THE SUMMER PRACTICE-TEACHING PLAN OF THE UNIVERSITY OF ARIZONA

H. H. FOSTER

Professor of Education, University of Arizona

In the development of the University of Arizona teacher-training system, necessity proved to be the mother of invention. The University's plans for a practice school were frustrated by the outbreak of the war, and for various reasons the local high school was unavailable for practice teaching. The solution of the problem was undertaken along somewhat unusual lines.

In the Spring of 1918, the city of Bisbee, Arizona, with a population of about 25,000, offered the University Department of Education the use of its school system for the school observation and practice teaching. Bisbee has one of the most efficient and progressive school systems in the Southwest, and the University realized that the opportunity was too good to neglect. The elevation of Bisbee, about 5,200 feet, gives it an ideal summer climate, and the city schools are in operation twelve months in the year, the summer quarter beginning about July first. Accordingly, the University initiated a summer session at Bisbee, in which teacher-training formed the central interest.

The practice teaching was done in the three junior high schools of the Bisbee system. Many of the regular teachers were taking their vacations during the first six weeks of the summer quarter, and so far as adapted, the practice teachers were given their classes. The salaries of the absent teachers were thus available and were divided equally among the practice teachers, each receiving about forty dollars for the six weeks. Four members of the University faculty acted as supervisors, in conjunction with the principals

and certain regularly employed teachers in the Bisbee senior and junior high schools. Nearly all of the subjects usually taught in junior high schools were included in the work taught by the practice teachers.

Each practice teacher received a university credit of three semester hours. Three courses of instruction were given by the University teaching staff, evenings and Saturday forenoons, including a course in "Principles of Teaching in High Schools," which was closely correlated with the practice teaching and was required of all who had not already completed the course during the regular academic year. Each course carried a three-hour credit, so that a student doing full work would earn a total of six semester-hours credit during the six weeks, and about twenty of the students included practice teaching as part of that six hours' work.

As in all 'first times,' adjustments and variations were inevitable. On the whole, however, the original plan remains with but few modifications. The plan as it has evolved is as follows. Each practice teacher has charge of two hours per day, each hour including both class instruction and supervised study. For such work she assumes full responsibility, subject to the advice and criticism of the supervisor. A third hour is devoted to visitation (under guidance) of other teachers in the school system. Thus one half day is consumed. She is also required to participate in the various out-of-class activities of the school and is assigned one group of pupils for her special charge.

The one summer's experience with the plan seems to justify its claim to several important merits, most of which are shared by other forms of organization. (1) The practice teachers are teaching in a real school, with normal boys and girls. No selection of pupils or 'making allowances' occurs, and the teacher enters into the full life and responsibility of the school. (2) The practice teachers first meet their classes as strangers. They are not handicapped by personal familiarity due to previous mingling on the same campus. Their pupils view them first and all the time as teachers. (3) The practice teachers mingle constantly with the regular experienced teachers on a professional par, and the consequent professional and personal intercourse contributes much to

the upbuilding of a professional spirit. (4) A unique feature is that of concentration. The practice teacher is not rushing from a college lecture in history, with its university atmosphere, to a practice-teaching exercise with school boys and girls, meanwhile with mind occupied with an incomplete experiment in bacteriology to be resumed immediately thereafter. The practice teacher's day's work consists solely of either teaching or learning how to teach. The conviction here prevailing is that too often practice teaching does not dip down deeply enough into real school teaching but is merely skimming the surface; that immersion in one's task and its atmosphere is as essential in teacher-training as in soldier-training. (5) Each practice-teacher is expected to teach two summers, at the close of the junior and of the senior years. Two such summers are included in the requirements for the teacher's diploma issued by the University Department of Education. It is felt that this sequence of practice followed by further theory and further practice will render both theory and practice more significant.

This first attempt was under favorable circumstances. Superintendent C. F. Philbrook, of Bisbee, and his principals and teachers were from the start favorable toward the experiment, and in most cases optimistic. The doubters were open-minded. Coöperation was perfect, and at the close of the session adverse criticism was not to be heard. The Bisbee school authorities are now urging an expansion of the work for the coming summer.

CHAPTER VIII

BIBLIOGRAPHY ON PRACTICE TEACHING FOR HIGH-SCHOOL TEACHERS

CONTRIBUTIONS TO THE SUBJECT PREVIOUS TO THE REPORT OF THE COMMITTEE OF SEVENTEEN (1907).

- Atkinson, Fred Washington. The professional preparation of secondary teachers in the United States. Leipzig, 1893. 64 pp. Bibliography: pp. 63-64.
- Cotton, Fassett A. Professional training of high-school teachers. In his *Education in Indiana*. Indianapolis, 1904. pp. 219-31.
- Elliott, Edward C., and others. The education and training of secondary teachers. *Nat. Soc. Scientific Study Educ. Fourth Yearbook*. Pt. I, 1905. 106 pp.
- Gilbert, Charles B. Discussion of the training of secondary teachers. *Nat. Soc. Scientific Study Educ. Fourth Yearbook*. Part II, 1906. Pp. 56-62.
- Hanus, Paul Henry. Professional preparation of high-school teachers. In his *Beginnings in Industrial Education, and other Educational Discussions*. Boston, 1906. Pp. 99-131.
- Indiana. Council of education. Professional training of high-school teachers. *Educator-Journal*, 2:346-52, March, 1902.
- Luckey, George W. A. *The Professional Training of Secondary Teachers in the United States*. New York, 1903. 391 pp.
- Manchester, O. L. Are we (normal schools) justified in attempting to prepare teachers for the high school? *Vidette*, February, 1901. Pp. 1-6.
- Russell, James E. The training of teachers for secondary schools. *Proc. N. E. A.*, 1901. Pp. 636-41.
- Snedden, David S. To what extent may the training given in our California State normal schools prepare for secondary-school teaching. *Western Jour. Educ.* 10:457-70, May, 1905.

CONTRIBUTIONS TO THE SUBJECT SINCE 1907.

- Alexander, Carter. The preparation of secondary-school teachers. *Proo. Assoc. Colleges and Secondary Schools of the Southern States*. 1913. Pp. 60-71.
- Bagley, William C. The professional training of high-school teachers. *Proc. N. E. A.* 1912. Pp. 686-91.
- Bakeless, O. H. The preparation and improvement of the high-school teacher. *Pennsylvania Sch. Jour.*, 57: 338-41, February, 1909.
- Baldwin, Bird T. Practice schools in university departments of education. *Jour. Educ. Psych.*, 1911, pp. 459-463.
- Brown, John Franklin. The professional training of the teacher. In his *The American High School*. New York, 1909. Pp. 197-207.
- Brown, John Franklin. *The Training of Teachers for Secondary Schools in Germany and the United States*. New York, 1911. Pp. 335.
- Carnegie Foundation for the Advancement of Teaching. Fifth annual report, pp. 75-77. The training of teachers.
- Childs, H. G. Benefits of practice teaching for secondary teachers; a follow-up study for eight years at Indiana University.

- Committee of seventeen. Reports on professional preparation of high-school teachers. *Proc. N. E. A.*, 1907. Pp. 523-668.
- Cook, John W. The practice school and the work of the heads of departments in it. *Proc. N. E. A.*, 1914. Pp. 541-48.
- Farrington, Frederic Ernest. Practice work in university departments of education. Austin, Tex., University of Texas, 1909, 42 pp. (*Bulletin of the University of Texas*, No. 134, November 1, 1909.)
- Farrington, Strayer, and Jacobs. Observation and practice teaching in college departments of education. *Yearbook of Society of College Teachers of Education*, 1909.
- Harwood, Samuel E. The training school as a school of observation and practice. *Proc. N. E. A.*, 1909. Pp. 557-61.
- Hillyer, Thomas Arthur. Professional training for teachers of secondary schools. *Proc. N. E. A.*, 1909. Pp. 587-92.
- Johnston, C. H. Facilities for teacher-training in colleges and universities. *School Review Monograph*, No. VI, February, 1915. Pp. 7-22.
- Kelly, F. J. and Scott, I. O. What training school facilities are provided in state normal schools. *Educ. Admin. and Super.*, November, 1915. Pp. 591-598.
- Kendall, Calvin N. Training of high-school teachers. *Sch. Rev.*, 21:92-102, February, 1913.
- Locke, George Herbert. The training of teachers for secondary schools, and the relation of the university thereto. *Proc. Ontario Educ. Assoc.*, 1907. Toronto, 1907. Pp. 121-32.
- Manny, Frank A. Practice teaching and observation work. Pp. 60-66 in *City Training School for Teachers*. Washington, 1915. (United States Bureau of Education. Bulletin, 1914, No. 47.)
- McGregor, D. Professional training for teachers of secondary schools. *Proc. N. E. A.*, 1909. Pp. 581-587.
- Morehouse, Frances. Practice teaching in the school of education, *University of Illinois Bulletin*, October 21, 1912, No. 8.
- Parker, S. C. *Methods of Teaching in High Schools*, Ch. XXI. Gives general suggestions for practice teaching. Largely the same as plans in use at University of Chicago.
- Pease, Henry. The professional training of teachers for the secondary schools. *Pennsylvania Sch. Jour.*, 59:282-85, February, 1911.
- Pittinger, L. A. Practice work for prospective teachers of English in the high school. *English Jour.*, 2:254-255, 1913. Describes this work at Indiana University.
- Preparation of high-school teachers. *Proc. N. E. A.*, 1907. Pp. 712-23.
(I. From the standpoint of the normal school. By J. H. Hill. II. From the standpoint of the university. By A. F. Lange.)
- Robertson, C. B. Training of secondary-school teachers. *Sch. Rev.*, 21:225-34, April, 1913.
- Russell, James E. Professional factors in the training of the high-school teacher. *Educ. Rev.*, 45:217-36, March, 1913.
- Sanders, W. H. Questionnaire with bibliography. *Pedagogical Seminary*, March, 1913. Pp. 48-57.
- Seerley, Homer H. The preparation of teachers for high schools. *Jour. of Educ.*, 82:117-18, August, 1915.
- Smith, H. L. High-school practice teaching in connection with Indiana University. *Educator Jour.*, 12:174-78, December, 1911.
- Suzzallo, Henry. Minimum qualifications for the training and certification of secondary-school teachers. *Proc. N. E. A.*, 1907. Pp. 252-56.

- Terman, Lewis M. Scholarship and the professional training of high-school teachers. *Educator Jour.*, 7:447-50, May, 1907.
- Van Hise, Charles R. The training of teachers for the secondary schools. *Proc. Nat. Assoc. State Universities*, 1908, Bangor, Maine. Pp. 16-43.
- Walker, N. W. The preparation of the high-school teacher. *Proc. North Carolina Assoc. City Public School Superintendents and Principals*, 1911. Raleigh, 1911. Pp. 78-88.
- West, Willis Mason. The university and the preparation of high-school teachers. *Proc. Minnesota Educ. Assoc.*, 1908. (St. Paul, Minn.) Pp. 76-83.
- Willard, J. Monroe. The problem of relating theory to observation and practice in the training of teachers for city schools. *Proc. N. E. A.*, 1912. Pp. 890-96.
- Wilson, Harry B. The problem of professional training for high-school teachers. *Western Jour. Educ.* (Ypsilanti), 3:49-60, February, 1910.
- Yocum, A. Duncan. Training of high-school teachers: A plea for colleges of education. *Pennsylvania Jour. Educ.*, 57:333-37, February, 1909.

BRIEF BIBLIOGRAPHY REGARDING TRAINING IN PRACTICE IN FOREIGN FIELDS

- Bulletin of English Board of Education, 1909. Training of secondary teachers; gives regulations governing practice work since 1909 for secondary teachers in England.
- Conference on the training of teachers in secondary schools for boys, Cambridge, England, 1902. Report of a conference on the training of teachers of secondary schools for boys, 1902. 140 pp.
- De Garmo, Charles. Professional training of teachers for the secondary schools of Germany. *Proc. N. E. A.*, 1907. Pp. 638-644.
- Dugard, Marie. De la formation des maitres de l'enseignement secondaire a l'étranger et en France. Paris, 1902. 242 pp.
- Farrington, F. E. *French Secondary Schools*, ch. xv.
- Findlay, J. J. The training of teachers in a university. Notes on discussion classes and demonstration schools. *Jour. of Educ.* (London), 45:839-41, December, 1913.
- James, H. R. *Training Secondary Teachers*: I. In the United Kingdom, H. R. James. II. In Prussia and America, H. Sharp. III. In Bombay, J. Nelson Fraser. Calcutta, 1909. 144 pp. India, education department. Occasional papers No. 5.
- Kurschak, Josef. *Die Ausbildung der Mittelschulprofessoren*. Budapest, 1911. 19 pp.
- Sandiford, Peter. *Training of Teachers in England and Wales*. *Zentralblatt fur die gesamte Unterrichtsverwaltung in Preussen*. 1908, 1909.

ARTICLES APPEARING SINCE THE COMMITTEE BEGAN WORK

- Bacon, G. M. The organization and administration of the practice school. *Jour. N. Y. State Teachers' Assoc.*, 5:85-88, April, 1918.
- Cade, G. N. and Gray, W. S. Objective studies of the achievements of training-school and public-school pupils in the freshman year of the high school. *Elem. Sch. Jour.*, 19:1-19, September, 1918.
- Colvin, S. S. The most common mistakes of beginning high-school teachers, *Sch. and Soc.*, 7: 1918.
- Diehl, J. D. Directed teaching and directed observation—a correction and an explanation. *Sch. Rev.*, 24:515-520, September, 1916.
- Gray, W. S. Effects of practice teaching on pupils of training school as shown by pupils' later progress. (Chicago).

- Holley, C. H. Forecasting success in practice teaching. *Jour. Educ. Psych.*, 495-497, October, 1916.
- Jacobs, W. B. Practice teaching for secondary teachers at Brown University. *Sch. and Soc.*, 3:533-535, April 8, 1916.
- Jarvis, C. D. Vocational teachers for secondary schools: what the land-grant colleges are doing to prepare them. *Bulletin U. S. Bureau of Education*, 1917, No. 38, pp. 14, 21, 27, 35, 38-85.
- Kent, Raymond A. Practice teaching at the University of Minnesota. *Sch. and Soc.*, 4: 140-144, July 22, 1916.
- Mead, A. R. Administrative features of practice teaching for secondary teachers. *Sch. and Soc.*, 3:752-754, May 20, 1916, also *Ohio Teacher*, 36: 508-509, June, 1916.
- Minnich, H. C. The national ratio of practice teaching. *Proc. of the Ohio College Association*, April, 1915.
- Minnich, H. C. The training department, *Miami University Bulletin*, Series XVI, No. 10, June, 1918, pp. 48-50. Well tabulated data on year's work.
- Payne, G. E. Scholarship and success in teaching. *Jour. Educ. Psych.*, 9:217-219.
- Sprague, H. A. Score card for rating student teachers. *Pedag. Sem.*, March, 1917, pp. 72-80.
- Walk, G. R. Practice teaching and observation in normal schools. *Education*, 38:69-85, October, 1917.
- Wilkinson, W. A. Functions and organization of practice teaching in state normal schools. *Educ. Admin. and Super.*, 4:289-296, June, 1918.
- Works, G. Organization of teacher-training under the Smith-Hughes law in New York State College of Agriculture. *Sch. and Soc.*, 7:666-667, June 8, 1918.

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THE EIGHTEENTH YEARBOOK

OF THE
NATIONAL SOCIETY FOR THE STUDY
OF EDUCATION

PART II

FOURTH REPORT OF THE COMMITTEE ON ECONOMY
OF TIME IN EDUCATION

BY

F. C. AYER, F. N. FREEMAN, W. S. GRAY, E. HORN
W. S. MONROE AND C. E. SEASHORE



Edited by GUY MONTROSE WHIPPLE, Secretary



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EDITOR'S PREFACE

In publishing this Fourth Report of the Committee of the National Education Association on Economy of Time in Education, the National Society for the Study of Education is only carrying out a policy that was inaugurated when the first report of that Committee was published and that has met with ready endorsement both by its own members and by the many persons outside its membership who have purchased the Fourteenth, Sixteenth and Seventeenth *Yearbooks* in which these earlier reports appeared. The fact that this Fourth Report includes a series of specific and straight-forward rules, or maxims, for special methods of teaching the three R's and that these maxims are based on the best experimental evidence obtainable will make this present report directly useful and, I am sure, uncommonly valuable.

G. M. WHIPPLE

FOREWORD

At a meeting of the Committee on the Economy of Time and its Cooperating Investigators, in Chicago, October, 1917, a committee was appointed, of which Dr. Ernest Horn, of the University of Iowa, was made chairman. This Committee was to be responsible for formulating such a monograph as it is possible to issue at this time, pertaining to "Economy in Learning." Its effort throughout has been to put its recommendations in simple, direct language, that its report may constitute a handbook and guide for the use of teachers and supervisors who are interested in planning classroom procedure with due regard for both economy and efficiency in teaching and learning.

The Committee on Economy of Time considers itself fortunate to be able to issue this *Yearbook* as one in the series of publications representing the results of its work.

H. B. WILSON, *Chairman*,
Committee on the Economy of
Time in Education

INTRODUCTION

The work of the Committee on Economy of Time in Education has so far been directed toward the achievement of economy through a better selection of what is taught. The assumption has been that it is uneconomical to teach a child something that he does not need to know, no matter how skillfully such material be taught. The work of the Committee has involved two things: first, a thorough-going acceptance of the point of view of social utility in curriculum making; and second, the choice of scientific method as the means of determining the content of the course of study. In subjects where the relation to life is obvious and where the data involved are relatively simple, great progress has been made. Such subjects are spelling, writing and arithmetic. In other subjects where the functions in life outside the school are not so obvious and where the data involved are subtle and elusive, the progress, while gratifying, has not been so great. There can be no doubt, however, that the *Yearbooks* in which these have been reported have been stimulating to superintendents in the reconstruction of their courses of study.

But after one has satisfactorily determined the course of study in a given subject, there remains the further problem of discovering the most economical methods of teaching it. It is this task to which the present Committee on Economy of Time in Learning has been assigned. Each of the six members of the Committee has accepted the responsibility of gathering for one elementary school subject, the experimental data bearing on the most economical methods of learning that subject. So far there has been no clearing-house for these experimental data.

In order to facilitate the search for pertinent investigations, particularly those which are unpublished, the following questionnaire was sent to departments of education in normal schools and universities in the United States.

QUESTIONNAIRE

To Head of Department of Education:

A special sub-committee has been appointed by the Committee of the National Education Association on Economy of Time to extend the work of the Committee along the line of economy in learning. It was felt that the time is right for attempting to collect and make available the various published and unpublished investigations which throw light on economy in teaching the following subjects: arithmetic; reading; writing; composition; spelling; drawing; and music. Responsibility for the material in these subjects has been apportioned as follows:

Arithmetic—Director S. A. Courtis,* Detroit.

Reading—Dean Wm. S. Gray, University of Chicago.

Writing—Professor Frank N. Freeman, University of Chicago.

Composition—Professor Jas. F. Hosic,† Chicago Normal School.

Spelling—Professor Ernest Horn, University of Iowa.

Drawing—Professor Fred C. Ayer, University of Washington.

Music—Professor C. E. Seashore, University of Iowa.

These studies when gathered will be digested and organized so as to be of greatest use to the classroom teacher. The Committee realizes that the task is arduous and ambitious, but believes that the work is worth all the effort which the Committee and those who cooperate can put into it. Nothing could do more to increase the interest of the scientific study of the problems in learning and to insure that such results as are now available will be carried over into classroom practice. Will you kindly send me a list of the published and unpublished studies which have been completed in your department along these various lines? To simplify sending the data, kindly use the following form:

Investigations, Unpublished

Subject (for example, Spelling) Author

Title of Study

Investigations, Published

Subject (for example, Spelling) Author

Title of Study Place of Publication.

The Committee wishes to complete its work at the earliest possible moment. Will you kindly send this material at your earliest convenience to the Chairman of the Committee, Dr. Ernest Horn, University of Iowa, Iowa City, Iowa?

Yours very truly,

ERNEST HORN, *Chairman*

The replies received indicated that few institutions were, or had been engaged in experimental work. It is possible, of course, that

*Mr. Courtis, learning that Professor W. S. Monroe had been at work on this problem for some time, asked that Professor Monroe take over this part of the report.

†Professor Hosic did not report.

some unpublished investigations were not reported. Each member of the Committee also carried on a search on his own account for investigations bearing on his particular problem.

The intention of the Committee has been to gather all available data, published and unpublished, digest them critically, and base upon them summary statements applicable to classroom work. The Committee has realized clearly the limitations under which it has worked. In the case of many problems the investigations are not conclusive, and in such cases the Committee at first hesitated to make definite recommendations. It decided, however, that it should accept this responsibility rather than to pass it on to the classroom teacher or to the superintendent, neither of whom ordinarily has the time or the opportunity to familiarize himself with the data.

The Committee has therefore decided to be definite, even at the risk, at times, of appearing arbitrary. Where the evidence upon which a statement is made is weak, that fact is pointed out.

By no means does the Committee consider that this report determines in a final way the most economical methods of dealing with the subjects treated. Such an interpretation would defeat the whole purpose towards which the Committee has labored. But this report undoubtedly does indicate methods by which practice can be made more efficient than it now is. It is hoped, too, that the definite statements here made will prove a stimulus to investigation which will make further improvement possible.

ERNEST HORN, *Chairman,*
Committee on Economy of Time
in Learning

CHAPTER I

PRINCIPLES OF METHOD IN TEACHING WRITING AS DERIVED FROM SCIENTIFIC INVESTIGATION

FRANK N. FREEMAN

Associate Professor of Educational Psychology, University of Chicago

INTRODUCTORY

The scientific evidence on which the following rules are based is in part direct and in part indirect. The evidence is direct when the efficiency of alternative methods of learning is compared, either statistically or experimentally; the evidence is indirect when the rule is derived by applying a general principle which has been scientifically verified. Of the statistical and experimental methods, the experimental is the more direct. It consists in the comparison of the performance of two groups of learners whose method of procedure differs only in certain definitely limited and known respects. The statistical method usually bases its conclusions on the comparison of two groups of learners whose procedure differs in an indefinite number of ways. The validity of the following answers to the practical problems of handwriting is of different degrees, according to the degree of directness of the evidence, the experimental method being the most valid and the indirect application of general principles the least. In each case the type of evidence will be indicated, and for convenience will be designated as *indirect*, *statistical*, and *experimental*. Evidence of a statistical or experimental sort which is not based on rigidly scientific investigation may be termed *observational*.

I. PROBLEMS RELATING TO THE POSITION OF THE BODY, ARM, HAND AND PAPER, AND SLOPE OF THE WRITING

Rule 1. The writer should face the desk squarely.

Evidence. Statistical evidence indicates that a side position causes spinal curvature and eye strain (5, 6, 7).*

Rule 2. Both forearms should rest on the desk for approximately three quarters of their length.

Evidence. Statistical evidence indicates that when one elbow is unsupported spinal curvature is produced (15).

Rule 3. The paper should be directly in front of the writer.

Evidence. Direct measurement and statistical evidence indicate that when the paper is on one side of the middle line the adjustment required of the two eyes is different. This causes eye-strain and a twisting of the head and body resulting from the impulse to get the eyes into a more favorable position, which in turn produces spinal curvature (6).

Rule 4. The paper should be tilted to the left (or to the right in the case of the left-handed writer) until the lower edge makes an angle of about 30 degrees with the edge of the desk, and the writing should slope to the right from the vertical by the same amount (to the left in the case of the left-handed writer).

Evidence. On these two related features the evidence is conflicting. Certain investigators present statistical evidence that the down strokes of the letters usually assume a direction approximately at right angles with the projection on the paper of a line joining the two eyes. If this relation is maintained, the head will remain erect so long as the down strokes are made directly toward the body or at right angles to the edge of the desk. The slope of the writing will depend on the position of the paper (1).

On the other hand, it is maintained on statistical evidence that when the paper is tilted the head is also turned so that the projection of the line joining the two eyes is brought parallel to the line of the writing, and that this turning of the head causes spinal curvature (7, citation of Ellinger and Schubert).

The contention of those who maintain that an oblique position of the paper and slanting writing is injurious is supported by further statistical evidence to the effect that children who write with a slant hold their heads nearer the paper than those who write vertically. This produces eye-strain and involves crowding of the

*References in parentheses relate to the list at the end of the chapter.

lungs and digestive organs (18, citation of Seggel, and 7, citation of Munich Commission Report).

The preponderance of evidence seems to indicate that vertical writing and the position of the paper squarely in front of the writer (with lower edge parallel to the edge of the desk) is best so far as posture and vision are concerned. The evidence is conflicting, however, and in applying the conclusions to writing English script an important qualification must be made. The investigations which have been cited all deal with the process of writing German script, which is considerably more complicated than English, and probably requires minuter attention to details of form. Furthermore, the slanting writing which was studied by these German scientists had an extreme slope of forty-five degrees. It is highly probable that this extremely slanting, complicated script is more injurious to vision and posture than the simpler English script which commonly makes an angle of sixty to eighty degrees with the base line.

This is not the only type of evidence which bears on the question of the position of the paper and slope of writing. The other type of evidence is concerned with the ease, freedom and rapidity of the writing movement. First, the side-to-side movement of the forearm and wrist is the easiest, and hence ought to be utilized, if possible, in writing (19, 20, 22). This movement cannot well be used in vertical writing.

Statistical and experimental evidence indicates that good writers make the sideward movement more fluently than poor writers (8).

Statistical, historical, and observational evidence indicates that rapid writing tends to slope (9, 16, 20).

The prescribed position of the paper and the slope of writing is probably *slightly* less favorable to posture than the vertical position and style of writing, but it is decidedly more favorable to fluency of movement. The balance of evidence is therefore in favor of the above rule.

Rule 5. The forearm should form a right angle with the base-line of the letters.

Evidence (statistical and experimental). This position is supported by the statistical evidence that it is more common among

good than poor writers, and by the further fact that it is a feature of a method which was justified by an experimental trial (8).

Rule 6. The hand should be placed with the palm down so that the wrist does not slope more than forty-five degrees from the horizontal.

Evidence same as 5.

Rule 7. The hand should rest on the third and fourth fingers, not on the side.

Evidence same as 5.

Rule 8. The forefinger should rest on the penholder below the thumb (nearer the pen point than the thumb).

Evidence same as 5.

Rule 9. The penholder should be grasped loosely.

Evidence same as 5.

II. PROBLEMS CONCERNING THE WRITING MOVEMENT

Rule 10. The writing movement should be a combination of the movement of the arm and the fingers. The arm movement is more prominent in the forward progress from letter to letter, and the finger movement in forming the individual letters.

Evidence (statistical and experimental). Individuals differ in the amount of arm movement, but scarcely any writers exclude the finger movement altogether (8, 16, 21).

Good writers use as much finger movement as poor writers. Writers who have been trained in freedom and fluency use somewhat more arm movement than poor writers. This is due, not to the use of less finger movement, but to the use of less of the irregular movements of the hand and wrist (8).

Rule 11. The writing movement, particularly in the early stages, should be divided into a series of units of movement, separated by very slight pauses. It is not continuous and uniform in speed. The units should correspond to natural divisions in the form of the letters, which are usually made up of an upward and a downward stroke.

Evidence (statistical and experimental). Good writers divide the writing movement into units by pauses more distinctly than do

poor writers. Writers who are trained to divide the writing movement into units make marked improvement (8).

Rule 12. The downward strokes of the letters should be toward the body or nearly perpendicular to the edge of the desk. This produces a slope in the writing which is approximately equal to the angle through which the paper is tilted (about thirty degrees from the vertical). In right-hand writing this causes a forward slant and in left-hand writing, a backhand slant.

Evidence (experimental and observational). Experiment indicates that a movement perpendicular to the edge of the desk is more rapid and easier than one which is in the direction of the long axis of the forearm, which would produce vertical strokes on the paper (19). This direction of the strokes has the further advantage of having them point toward the eyes and probably greatly diminishes a tendency to turn the head which would be produced by strokes in a different direction. Experience and observation indicates that this direction of strokes is common and natural.

Rule 13. If the child can readily use the right hand, he should do so. If he has very strong preference for the left hand and finds it much more difficult to use the right hand, he should be allowed to use the left.

Evidence (indirect, statistical, and observational). From two to four per cent. of all children are decidedly left-handed (3). Statistical evidence has been adduced to indicate that compelling a left-handed child to write with his right hand leads to speech difficulties (2). While this evidence is not entirely conclusive, observation does indicate that the right-hand writing of a left-handed child is poor, and that worry and nervous disturbance result from forcing him against his will to write with his right hand.

III. PROBLEMS RELATING TO THE EFFECT OF AGE AND MATURITY ON WRITING

Rule 14. The speed of writing should be low at the beginning and should gradually increase from about 30 letters per minute at the end of Grade II to about 73 letters per minute at the end of Grade VIII.

Approximate standards of attainment for the successive grades

based on the median scores of a large number of children are as follows: Grade II, 30; III, 44; IV, 51; V, 60; VI, 63; VII, 68; VIII, 73 (12).

Evidence (indirect). Young children are incapable of making new coordinated movements rapidly (4, 14). (Statistical) All surveys of the speed of writing of children have shown that there is a marked increase in speed (10, 11, 12, 17).

Rule 15. The standard of accuracy should be low at the beginning and should gradually increase as the child gains in maturity and practice. Letters should be large at the beginning, because large letters do not need to be so accurate as small letters. Regularity and correctness of form should gradually increase from about 35 on the Ayres scale (85 on the Thorndike scale, and 11 on the Freeman scale) at the end of Grade II, to about 66 on the Ayres scale (13.5 on the Thorndike scale, and 21 on the Freeman scale) at the end of Grade VIII.

Approximate standards of attainment for the successive grades based on the median scores of a large number of children are as follows (12):

Grade	Ayres Scale	Thorndike Scale*	Free man Scale
II.....	35	8.5	11
III.....	39	9.3	12.5
IV.....	46	10.2	14.5
V.....	50	11.0	16
VI.....	57	11.9	18
VII.....	62	12.7	20
VIII.....	66	13.5	21

*The values on the Thorndike scale are estimated.

Evidence (indirect). The steadiness and accuracy of movement increases greatly with maturity (4). (Statistical) All surveys have indicated marked improvement in the form of the writing from the first to the eighth grade (10, 11, 12, 17).

Rule 16. The materials used by the primary child in writing should minimize the difficulty of the task. The first-grade child should write with a pencil having soft lead, on unglazed paper. The pencil should also be used in the second grade. The use of pen and ink may be begun in the third grade.

Evidence (indirect and observational). This rule is an inference from the deficient motor coordination of the child. It has been

found workable in practice, but has not been directly verified by scientific experiment (4, 9, 14).

Rule 17. Exacting formal drill should not be given before about Grade IV. The greater part of the practice throughout the grades should be given to actual writing of words. Insistence upon position or type of movement should first become strict about Grade IV. During the primary grades only the gross faults should be corrected.

Evidence (indirect). Growth in skill of movement is marked at about the 9th year (4). (Statistical) Few pupils who are given arm movement drill can use the arm movement before the fourth grade (21).

IV. METHODS AND DEVICES

Rule 18. There should be specific, directed practice in writing.

Evidence (statistical). Pupils who have such practice write decidedly better than those who have not (8).

Rule 19. Ten to fifteen minutes a day is probably the best length of practice period.

Evidence (statistical). Comparison indicates that school systems which employ periods of 15 minutes a day obtain as good results in writing as those which employ longer periods (12).

Rule 20. The larger part of the practice period—at least two thirds on the average—should be occupied by the pupils in actual practice. Directions and discussion should be made as concise as possible. Use the time of the whole class to discuss only those faults which are general.

Evidence (indirect). Studies of motor learning indicate that many repetitions of an act are necessary to improvement and that rate of improvement is largely proportional to the amount of practice. Verbal directions or example can only supplement, and cannot be a substitute for, actual practice.

Rule 21. Standards of achievement in terms of definite measures of form and speed should be set before the pupil and his own writing should be measured in the same terms in order that he may trace his progress and relation to the standard.

Evidence (experimental). Experimental studies (some unpub-

lished) indicate that the pupil's knowledge of his standing and progress is stimulating (8).

Rule 22. The pupil's analysis of the form of his writing should be directed in turn to the specific elements of excellence, such as uniformity, letter formation, quality of line and spacing, and not simply to general merit. The use of a chart which represents different degrees of merit in the specific elements of excellence is to be recommended. In the case of the better writers it is sufficient to study such a chart and to analyze one's own writing one element at a time. A week or more in the year should be given to the study and practice on each element. In the case of the poor pupil it is advisable to score the writing by an analytical scale as directed in the "Plan for Testing and Keeping Records" at the end of this article.

Evidence (experimental). This procedure was part of a successful experimental course (8).

Rule 23. Pupils should maintain a balance between attainment in form and in speed, so as not to develop one quality to an extreme degree at the expense of the other.

Evidence (indirect). There is evidence that the two qualities of speed and form are to a large degree interchangeable. Pupils may, by emphasis on one or the other quality, be led to a higher attainment in the quality emphasized.

(Statistical) School surveys indicate different relationships between average speed and average form in different schools or systems, and also a different distribution of individuals with reference to the two qualities, particularly at the extremes (11, 12, 13, 17).

Rule 24. Drill exercises which require sweeping side-to-side movements develop fluency in the use of the arm in carrying the hand forward continuously while the letters are being formed.

Evidence (indirect and experimental). The value of such exercises is inferred from the importance of the lateral movement which appears from the comparison of good and poor writers, and is confirmed by the fact that they constituted a part of a successful experimental course (8).

Rule 25. Counting is a useful temporary device to lead the

pupils to organize the movement into units. The parts of the letters which are included in movements made during the successive counts must be determined by careful experiment.

Evidence (experimental). This device is part of a successful experimental course (8).

Rule 26. Considerable individual variation in position and type of movement should be allowed.

Evidence (statistical). Laboratory studies indicate that large individual variation exists, even among pupils who are taught by the same method (8, 16).

Rule 27. The copy for the formal writing drill should consist of letters which are classified on the following plan. (1) Those letters should be grouped together which require similar movements. There are in general, three classes, those which are made by (a) an over-curved movement, (b) an under-curved movement, or (c) a mixed movement. (2) The simpler letters of the first two classes should be taken first and the mixed letters last. (3) Most of the practice should be upon words, but these words should be composed of letters which are first introduced singly. After all the commonly used letters have been practiced much of the practice may be upon sentences which are taken from the content of other courses.

Evidence (indirect and observational). These directions are based on the general observation that skill is best developed by beginning with the easier and proceeding to the more difficult of a series of acts and by confining practice at the beginning to one difficulty at a time.

Rule 28. A simple style of writing of medium slant (sixty to seventy degrees) and no flourishes is to be preferred.

Evidence (observational). The reasons for a simple style of writing are that it is more economical to produce and easier to read. There is no scientific basis and probably little basis of any sort for a choice among the many slightly different forms in common use.

PLAN FOR TESTING AND KEEPING RECORDS OF THE PUPILS' PROFICIENCY IN HAND WRITING

Rules 21, 22, and 23 direct that records shall be kept of the pupils' progress and that these records be used as guides in direct-

ing their practice. The following directions give details of the procedure by which this may be done.

The Nature of the Records

There should be an individual record of the attainment of each pupil and a group record of the attainment of the class as a whole.

RECORD IN SPEED									
Name _____						year _____ Grade _____			
	SEPT.		DEC.		MAR.		JUN.		
130									NORM
120									
100									
90									
80									
70									
60									
50									
40									
30									
20									

Fig. I

Every pupil should have a record of his attainment (in speed and form separately) which gives his standing on at least four dates during the year—September, December, March, and June. If practicable, a record can be made each month.

Specimen forms for making these records graphically are shown in Figures I and II. These forms (without the line which indicates the norm) may be printed, or mimeographed, or made by each pupil. If they are duplicated, the same form may be used for all the grades, but the line indicating the norm must be drawn separately for the individual grades. The norms are given in Rules 15 and 16.

After each test, each pupil should indicate his scores by short marks on the appropriate vertical lines on his record blanks. The

RECORD IN FORM									
Name -----							Year ----- Grade -----		
	SEPT.			DEC.			MAR.		JUN.
90									
80									
70									
60									
50									
40									
30									
20									

NORM

Fig. II

percentage of pupils who have reached or exceeded the norm for the grade should also be indicated on the class record blanks, the first indicating the percentage of the children who reach the norm in speed, the second indicating the percentage who reach it in form, and the third indicating the percentage who reach it in both form and speed.

The units for scoring on the record blank for form correspond to the units of the Ayres Handwriting Scale (Russell Sage Foundation). If some other scale is used, the units which it employs should be substituted. The units of the speed record are letters per minute.

A more detailed record should be kept of the writing of the poorer pupils. This may include all who are 5 or 10 points below the norm. The blank for such a record is shown in Figure IV.

This record is not a graph, as are the others, but consists of the scores in figures. Scores are recorded in five characteristics of the writing and in the combined value of all. The pupil should be drilled especially in the element in which his writing is poor.

Scoring in the five constituents of writing may be done by means of an analytical scale, such as the Freeman Handwriting Chart (Houghton Mifflin Company).

CLASS RECORD IN SPEED - PERCENTAGE UP TO NORM												
School -----						Year -----						
Teacher -----						Grade -----						
	SEPT.		DEC.		MAR.		JUN.					
90												
80												
70												
60												
50												
40												
30												
20												
10												

Fig. III

Note.—A similar chart should be made to indicate the class record in form, and a third to indicate the record in both form and speed.

ANALYTICAL RECORD IN FORM				
Name -----			Year -----	
			Grade -----	
	SEPT.	DEC.	MAR.	JUN.
Uniformity of slant				
Uniformity of alinement				
Quality of line				
Letter formation				
Spacing				
Total				

Fig. IV

Method of Conducting the Test

1. Give the pupils some preliminary practice in writing the words which they will write in the test so that they can write them

freely from memory. In the second and third grades use some suitable rhyme, as:

“The rain is raining all around,
It falls on field and tree,
It rains on the umbrellas here
And on the ships at sea.”

In the fourth to the eighth grades use the *names* of the numerals (not the figures), *one, two, three*, etc., practicing up to *thirty*.

2. Be provided with a stop watch or watch with a second hand.

3. See that the pupils are ready with pen and ink (or pencil in the grades in which pens have not been used) and paper.

4. Instruct the pupils substantially as follows:

“We are to have a test [or game] to see how well you can write. To write well means to write rapidly and also to make it look well. We are going to write what we have been practicing [make sure the pupils know what this is]. You will start when I say ‘Begin’ and stop when I say ‘Stop.’ Be sure to keep writing all the time till I say ‘Stop.’ [If this is the first test, give a trial or two in starting and stopping on other paper than that which is prepared for the test.] Remember, write well and rapidly and keep on writing until I say ‘Stop.’”

5. See that everybody is ready, start the watch, or wait till the second hand is at zero, and say “Begin.”

6. Keep watch of the pupils and start going again any that may stop.

7. Note the watch carefully and say “Stop” exactly at the end of *two minutes*.

8. Glance about and stop any pupils that may continue.

Scoring the Papers

The speed may be quickly and accurately scored by the following procedure:

1. Make a scoring copy by writing out the text and placing above each word the number of the letters in the text up to the end of that word.

2. Note the last letter the pupil has written and give him

provisionally the corresponding score by referring to the scoring copy.

3. Read through the pupil's copy to see that it is correctly written and add or deduct any letters he has inserted or left out.

4. Divide by two in order to get the score in terms of letters per minute.

The form may be scored by following the directions which accompany the scale which is used. In general, some practice is needed before scoring can be done accurately.

REFERENCES

1. Ahrens, August. *Untersuchungen über die Bewegungen der Augen beim Schreiben*. Rostock, 1891.
2. Ballard, P. B. Sinistrality and speech. *J. of Exper. Ped.*, 1:1911-12, 298.
3. Beeley, A. L. *An Experimental Study in Left-Handedness*, Supplementary Educational Monographs, University of Chicago.
4. Bryan, W. L. On the development of voluntary motor ability. *Amer. Jour. Psychol.* 5: pp. 125-204.
5. Burgerstein, Leo. *School Hygiene*. Tr. by Beatrice L. Stevenson and Anna von der Osten.
6. Cohn, H. L. *Hygiene of the Eye in Schools*. Tr. by W. P. Turnbull.
7. Eulenberg, H. and Bach, T. *Schulgesundheitslehre*.
8. Freeman, F. N. *The Handwriting Movement: A Study in the Motor Elements of Penmanship Excellence*. Univ. of Chicago Press, 1918.
9. Freeman, F. N. *The Teaching of Handwriting*. Houghton Mifflin Co., 1914.
10. Freeman, F. N. *Survey of the Schools of Grand Rapids, Mich.*, 1916.
11. Freeman, F. N. *Survey of the Schools of St. Louis, Mo.*, 1917.
12. Freeman, F. N. *Fourteenth (1915) and Sixteenth (1917) Yearbooks of this Society*.
13. Freeman, F. N. Some practical studies of handwriting. *Elem. School Teacher*, 14:1913, 167-179.

14. Gilbert, W. A. Researches on the mental and physical development of school children. *Studies from the Yale Psychological Laboratory*. 2:1894, 40-100.
15. Javal, *Essay on Physiology of Writing*. New York, 1894.
16. Judd, C. H. *Genetic Psychology for Teachers*. 1903, Chap. 7.
17. Judd, C. H. *Measuring the Work of the Public Schools*. Cleveland Foundation.
18. Kotelmann, L. *School Hygiene*. Tr. by J. A. Bergstrom.
19. McAllister, C. N. Researches on the movements used in writing. *Studies from Yale Psychological Laboratory*. 8:1900, 21-63.
20. McMillan, D. P. - Report of Dept. of Child Study and Pedagogic Investigation. Report of Chicago Public Schools, 1902-3.
21. Nutt, H. W. *Rhythm in Handwriting*. Master's Thesis in Univ. of Chicago Library. Also *Elem. School Jour.* 17: 1917, 432-445.
22. Woodworth, R. S. The Accuracy of Voluntary Movement. *Psychol. Monographs*, 1899.

CHAPTER II

PRINCIPLES OF METHOD IN TEACHING READING, AS DERIVED FROM SCIENTIFIC INVESTIGATION

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The Committee on Economy of Time in Education has reported during the last four years a number of studies and reports on reading. In the *Fourteenth Yearbook* (1915) Supt. R. G. Jones discussed the determination and use of standard vocabularies in the primary grades, and S. A. Courtis discussed the determination and significance of standard rates of reading. In the *Sixteenth Yearbook* (1917) the relation of silent reading to economy in education was discussed and O. F. Munson and J. H. Hoskinson reported the results of an investigation to determine the prevailing practice regarding the use of library and supplementary-reading books in the different grades of the elementary schools in fifty American cities.

The discussion which follows summarizes much of the work which has been done during recent years concerning economy and efficiency in teaching reading. The discussion has been organized about the following points: (1) growth periods in the development of reading ability, (2) suggestions relating to the teaching of oral reading, (3) factors influencing the rate of silent reading, (4) suggestions relating to the improvement of rate of reading, (5) suggestions relating to the improvement of comprehension, (6) suggestions relating to the hygiene of reading, (7) current tests of reading.

GROWTH PERIODS IN THE DEVELOPMENT OF READING ABILITY

1. *Accomplishment in oral reading increases rapidly in the lower grades and steadily, but less rapidly, in the upper grades. In the Sixteenth Yearbook, Part I, (14)* it is reported that accom-*

plishment in oral reading begins at a low level in the first grade, increases rapidly in the second and third grades, and continues to increase gradually, but less rapidly, through the remaining grades of the elementary school. Many schools have been tested in which the pupils of the third grade were able to read passages of considerable difficulty independently and fluently. Rapid progress of this type in the lower grades prepares the way for independent and effective reading during silent study periods in the upper grades. Recent investigations (13) show clearly that accomplishment in oral reading can, and should reach a relatively high level by the end of the third year.

2. *Rate of oral reading increases rapidly in the first three grades, and approximates a maximal rate in the fourth grade, excepting in the case of difficult passages.* The records (15) for rate of oral reading of more than 7,000 pupils show that the normal rate of articulation is approximated for simple passages by the end of the third grade. In the case of passages of considerable difficulty the normal rate of articulation is not attained until later in the grades. Calculations based on the records mentioned above show clearly that the classes and the pupils who do not attain fluency in oral reading are usually slow, ineffective silent readers. This is due to the fact that for the poor reader the mere mechanical processes are obstacles, and he loses time in taking the preliminary steps which are necessary before he can comprehend the passage. Much oral reading of simple selections in the first three grades aids in the establishment of the habits and associations which are prerequisite to rapid silent reading.

3. *Accuracy in the pronunciation of simple words increases rapidly in the lower grades. Longer and more difficult words present real difficulties throughout the upper grades.* These conclusions are based on the records (15) of 7,000 pupils in Cleveland and St. Louis. The unpublished records of 1,500 pupils in Indianapolis give further support to the statements. Cities and schools differ widely in the emphasis which they give to the development of independence and accuracy in the recognition of words in the lower

*Numbers in parentheses refer to the list of 35 references that concludes this chapter.

grades. Rapid progress in reading accomplishment depends largely on the ability of pupils to pronounce words accurately at sight. By the end of the third grade pupils should be able to analyze and pronounce simple words without hesitation. During the fourth, fifth and sixth grades the analysis of longer words should be emphasized. In this connection pupils should be trained in the use of the dictionary and in the application of the rules of syllabication and accent. The schools which are making most effective progress in word analysis assign such exercises to special drill periods.

4. *Mastery of the mechanics of reading is frequently acquired more rapidly than ability to comprehend the meaning of what is read.* Two investigations (13 and 22) have been reported which deal with the relation of oral-reading accomplishment to comprehension of subject matter. Both investigations emphasize the fact that during the third and fourth grades many pupils develop so rapidly in ability to analyze words that they do not recognize the meanings of all the words which they pronounce. The results of these studies suggest the desirability of giving less emphasis to oral reading after the third grade and of giving increased emphasis to the content of what is read during silent study periods.

5. *Rate of silent reading increases rapidly in the lower grades and approximates a maximal rate in the upper grades.* Several investigations of the rate of silent reading were summarized in the *Sixteenth Yearbook, Part I*, (14) in approximately the following terms. Progress in rate of silent reading is most rapid in the second, third and fourth grades. These facts harmonize with the conclusions reached by Courtis and others that a pupil's habits in regard to rate of silent reading are established for the most part by the end of the sixth grade. It is evident, therefore, that the fourth, fifth and sixth grades represent a period in which rate of silent reading may be emphasized to advantage. Courtis (7) states his conclusions as follows: "It will be seen that the curve for normal reading rises to a high level and does not reach its maximum until the high-school years. The curve for careful reading, on the other hand, is practically constant from the sixth grade on. This probably means that the rate and character of one's serious reading is fixed in the early school life." These conclusions justify the rec-

ommendation that teachers give specific attention to problems of rate of silent reading during the fourth, fifth and sixth grades.

6. *The rate of silent reading surpasses the rate of oral reading between the second and fourth grades.* Evidence for this statement is secured from the conclusions of a number of investigations of the problem. The rate of recognition (20) surpasses the rate of articulation at the beginning of the fourth grade. The rate of silent reading (13) for second- and third-grade pupils is less rapid than the rate of oral reading. In the fourth, fifth and sixth grades pupils read silently at a rate which is distinctly more rapid than the rate of oral reading. A study (24) of approximately 1,000 pupils showed that third-grade pupils on the average read silently more rapidly than orally. In still another investigation (21) it was found that in some schools the median rate of silent reading surpassed the median rate of oral reading as early as the second grade; in other schools this did not occur until the fourth grade. These results support at least two conclusions. First, rapid silent readers can be developed much earlier in the grades than is usually done at the present time. Second, silent-reading exercises can be substituted to advantage for oral reading by the end of the third grade, since pupils have reached the point in their development where silent reading is a more economical and rapid process than oral reading.

7. *Ability to comprehend the meaning of what is read improves steadily throughout the grades.* In the *Sixteenth Yearbook, Part I*, (14) several investigations were summarized in the following terms: "The figure shows that progress in ability to secure meaning from the printed page is made throughout the grades, that the progress is less marked in the lower grades and more marked in the upper grades." The results of practically every investigation of this problem indicate clearly the appropriateness of emphasizing the content of what is read, persistently and consistently, throughout the grades.

8. *Ability to comprehend simple statements of fact should be developed by the end of the third grade.* An investigation (16) carried on through the use of the Courtis Silent Reading Test No. 2 showed that it is possible for practically every pupil of a school

to secure a comprehension index of approximately 100 by the end of the third grade. These results are distinctly superior to the average for several cities. This fact indicates that many pupils in the public schools pass beyond the third grade without establishing the fundamental habits on which intelligent reading depends. The investigation resulted in the recommendation that habits of associating meaning to the passages which are read be emphasized from the beginning and that every pupil be required to comprehend the meaning of simple sentences, with almost perfect accuracy, by the end of the third grade. If habits of intelligent reading are not developed early, there is danger that habits of thoughtless reading will become permanently established.

9. *During the fourth, fifth and sixth grades pupils should be taught to understand selections of increasing difficulty and they should be trained to utilize reading ability in a variety of ways.* In the judgment of the writer the reading exercises which are assigned during this period should be as varied in character as are the demands which are made on the reader both in and out of school. The typical reader is called upon to utilize reading ability in a variety of ways. The following are illustrations:

1. To read for the purpose of giving a coherent reproduction.
2. To determine the central thought or the most important ideas of a selection.
3. To select a series of closely related points and their supporting details.
4. To secure information which will aid in the solution of a problem or in answering questions.
5. To gain a clear comprehension of the essential conditions of a problem.
6. To discover new problems in regard to a topic.
7. To determine the lines of argument which support the point of view of the author.
8. To determine the validity of statements.

If each of these uses of reading is to be emphasized effectively, special sets of reading habits and attitudes must be developed. As far as possible, the teachers of the fourth, fifth and sixth grades should instruct pupils in regard to various methods of study and

should endeavor to establish effective habits of reading in connection with each type.

SUGGESTIONS RELATING TO THE TEACHING OF ORAL READING

1. *Oral-reading exercises are appropriate for the early lessons in reading instruction.* Judd (20) points out the fact that oral reading is the natural form of primary reading. The child brings to the reading class a fully developed mastery of many sounds and their meanings. As soon, therefore, as a pupil recognizes the pronunciation of a word, its meaning is suggested to him by its sound. After a word has been recognized several times in oral reading it should be encountered frequently in silent-reading exercises so that the sight of the word will suggest its meaning without the intermediate step of pronunciation.

2. *Reading exercises should emphasize the content of what is read.* If a pupil reads for content from the beginning, it naturally follows that he will form the habit of looking for meanings or information whenever he reads. In order to facilitate this attitude, the selections which are read should be of real interest and significance to the pupil. Furthermore, this method of teaching reading facilitates rapid progress in word recognition. Numerous experiments show that words are recognized more quickly if they are associated with content than if they are learned in isolation. Cattell used the tachistoscope and exposed letters, phrases and sentences. His results showed that when sentences or phrases were exposed they were either grasped as wholes or not at all. Huey (19) found striking confirmation to this view in an experiment in which sentences were momentarily exposed. "Rarely were single letters read, even as forming the beginning or ends of words that were but partially recognized. The readings were of whole words, and almost always of words connected in some sense fashion." Boggs (2) conducted an experiment to determine the number of times each of the following had to be shown to a child to be quickly recognized: a letter of the Greek alphabet, a meaningless syllable, a word with definite content, and a sentence. In all cases the sentence was recognized the first time more often than any other unit. The foregoing references include only a few of the experiments which

have been carried on along this line. The results justify the conclusion that the process of learning words in the early reading exercises will be facilitated by presenting them in sentences or longer passages and by concentrating attention on the meaning of what is read.

3. *Independence in the recognition of words should be developed in the early grades by means of word study and phonetic analysis.* The practice is followed almost universally of conducting drill exercises in which the basic words which have been presented in reading exercises are learned to the point of instant recognition. Various devices, such as flash-card exercises, finding given words in sentences, phonetic analysis of words, etc., are employed. This procedure finds justification in the results of investigations which have been made of the problem. Judd (20) secured photographic records of children's readings and made an analysis of the records to determine the results of training. The pupils included in the investigation had been trained largely according to the word or sentence method and were supposed to read primarily for meaning. Instruction of this type had been supplemented by some training in phonics. The pupils were selected with a view to including the poorer readers and the better readers in each grade.

An analysis of the records showed clearly that pupils encountered difficulties in their reading and that periods of evident confusion occurred from time to time as evidenced by the fact that the steady forward movement of the eye was interrupted. These complicated series of eye-movements exhibit a failure of recognition to follow its normal course and suggest that the child was exploring the letters in the words in order to recognize the word as a whole.

"The foregoing discussion can be translated into the terms ordinarily used in describing school methods. The word method begins with the assumption that the word is the natural first unit of recognition. As the words become numerous and complicated, the word method usually adds a plan of phonic analysis. The motive of this added analysis is to help pupils to keep out of periods of confusion.

"Training a child in the analysis of words may very properly

be described as training him in the mechanics of reading. Purely mechanical training is in an important sense in opposition to the purpose of the school in its efforts to make good readers. The school aims to reach the level of fluent synthetic grasp of phrases. Mechanical training does, indeed, temporarily prevent the pupil from understanding the meaning of passages. Mechanical training would not be justified if distractions could be avoided by ready recognition of words."

The final conclusions of this phase of the study were that pupils should be taught to read for content, that the word should be accepted as the unit of recognition at the outset and that analysis or phonetic training should be introduced later when it is needed to keep the word units clear.

The experiments reported in References 5, 11, and 18 of the bibliography are interesting in connection with this problem, although they lead to widely different conclusions.

4. *Phonetic analysis should be introduced in special drill periods after pupils have begun to note similarities and differences in the words which they have learned in reading exercises.* It is the judgment of the writer that detailed studies of words should be made during drill periods set aside for this purpose. If such studies are made during the regular reading period there is danger that attention will shift from the content of what is read to the study of individual words. If the basic training in the analysis of words is given during drill periods, the information and skill thus secured can be applied quickly and effectively during reading exercises without withdrawing attention from the content of what is read.

A number of progressive schools follow the practice of introducing phonics about the end of the second month of the first grade. By this time the pupils have learned a limited reading vocabulary and their attention has already been called to the similarities and differences between such words as *ran* and *can*, *cat* and *sat*, etc. In connection with the reading lessons the pupil notes some of the familiar elements in the new words. A suggestion or direction from the teacher leads him to a recognition of the new words by combining familiar elements. After the pupil has met

with success a few times in the incidental study of new words, he is prepared, psychologically, to begin a systematic study of words and their elements. If such studies are introduced with the first reading lessons, the pupil does not have the background of facts and intelligent interest in words which are essential if words are to be studied quickly and effectively.

5. *What phonic system should be used?* This specific problem has not received detailed attention in the literature of reading investigations. It is, therefore, impossible to give a final answer to the question. Effective results can be secured with almost any method in use, as shown by the fact that there are representative schools for each method which rank high as determined by current tests of oral reading. Again, there are schools for each method which rank very low.

In the selection of a phonic system there are two general considerations which should be borne in mind: (a) the sounds of the successive elements into which a word is divided should result in a natural and accurate pronunciation of the word when the sounds of these elements are combined; (b) the system of analysis which is used should be so organized that the habits developed in the analysis of short words in the lower grades will aid rather than interfere with the accurate analysis of longer words when they are encountered.

6. *Which of the current methods of teaching beginning reading is most effective?* Only a limited number of investigations of this problem have been reported. Usually not more than two methods have been compared in any one investigation. No investigation thus far reported has been sufficiently controlled to justify the conclusion that the results were a true measure of the value of the different methods under consideration. The conclusions of a number of investigators are summarized in the following paragraphs.

Bliss (1) compared the achievement of two groups of pupils which had been taught by different methods. His conclusions follow: "While the scope of these tests is too limited and the number of pupils involved too few to warrant an authoritative statement that one of the two systems of reading is more efficient than

the other, the general tendency of the results is unmistakable. If the tests were given in other school systems or repeated several times in a single system with a resulting similar tendency, any element of doubt would be finally removed. They certainly imply that it is possible for the school superintendent to make a selection of a basal system of reading on a more authoritative basis than mere opinion."

Gray (13) reports the results of a study to determine whether the Aldine system or the Ward system secured the more effective results in the mechanics of oral reading. Of the 44 schools tested, 26 schools used the Aldine method, 17 schools used the Ward method, and one school used its own method. The results showed that differences in method were not accompanied by uniform differences in accomplishment. The average score for each of the two groups was approximately the same. A study of the records of individual schools showed that of the schools which ranked highest in the primary grades, some had been taught by the Ward method and some by the Aldine method. Of the schools which ranked lowest, some had followed the Ward method and some the Aldine method. The study verified the opinion which is current that there are factors other than the specific reading method employed, such as the teacher, the economic level of the pupils, the nationality of the pupils, the amount of supplementary reading material covered, etc., which must be considered in determining the causes of success or failure in primary reading.

Harris and Anderson (17) carried on an investigation in the Dubuque schools to determine the efficiency of the Beacon, Horace Mann, and Aldine systems of primary reading. The results of both the oral- and the silent-reading tests indicated superior accomplishment on the part of pupils who had been taught reading by the Beacon system. The investigation was too limited in scope to justify final conclusions. Similar studies should be made in a larger number of schools with school populations which differ widely and with a larger number of teachers to determine whether or not the results are a measure of the superiority of a given system or of some other factor, such as the special ability of an individual teacher.

Hendricks (18) made an investigation to determine whether pupils who had been trained by the Rational Method could read more or less effectively than pupils trained in schools where no system of technique was used. The results showed that the pupils who were taught according to the Rational Method were superior both in rate of reading and in the comprehension of what was read. Inasmuch, however, as the second group of pupils followed no specific method, it is possible that the results are a measure of the advantage of a well-organized system over a poorly organized system.

Waldo (33) reports the results of an investigation to determine the relative efficiency of the pupils in rate and comprehension in silent reading who had been trained according to the Ward system and the Howe system. All the children below the sixth grade started with the Ward system except one section which had the Howe system. The pupils were tested by their respective teachers with materials selected from *Current Events*, a school paper. The results showed that the pupils who had been taught by the Howe method did the best reading in the fall test. In the spring test this group had lost its leading position. "This cannot be attributed to the Howe method entirely, for the teacher in that third grade, although she tried to work both systems, did not carry on the drills as thoroughly as she might, being more interested in the Ward method." Other explanations were offered, all of which emphasize the fact that numerous complicating situations arise which make it difficult to determine the efficiency of each of several methods with a single test applied to limited number of classes.

As stated in the introduction to this section and as evidenced by the results of the experiments which have just been summarized, final conclusions cannot be drawn in regard to the relative value of the various systems of reading in current use. Superintendents and teachers will find it necessary, therefore, to examine reading systems carefully and to estimate their value in the light of some of the general principles outlined in the earlier sections of this report. The following are suggested: An effective method (a) should place emphasis on the content of what is read by means of selections which are of real interest and significance and by means

of the methods which are employed, (b) should develop independence in the recognition of words by means of word study and phonetic analysis introduced in special drill periods after the pupil has acquired a basic vocabulary through content reading, and (c) should provide a system of phonics which leads to a natural and accurate pronunciation of words when the sounds of the successive elements of words are combined and which will aid, rather than interfere with the analysis of longer words when they are encountered in grades above the second.

7. *Two different types of oral-reading exercises should be provided for the second and third grades.* By the time a pupil enters the second grade he has learned a reading vocabulary of a few hundred words; he has gained some power in the recognition of new words; and he is able to read simple interesting selections independently with a fair degree of success. On the other hand, he is unable to recognize at sight many words which he hears daily in the conversation of his parents and friends; he recognizes individual words rather than groups of words at a single fixation of the eyes, and he is unable to read with a great deal of fluency. In order to promote the establishment of the fundamental habits and associations on which fluent reading depends, many progressive schools require much sight reading of simple selections during the second and third grades. In order to develop additional power in attacking increasingly difficult problems of meaning, pronunciation, enunciation, expression, etc., supervised study periods are organized in which the teacher gives specific help and instruction along needed lines. In the first type of exercise simple supplementary materials are used; in the second type basic readers are used which contain carefully graded selections.

8. *The oral-reading exercises which are required in the fourth, fifth and sixth grades should be conducted under the stimulus of a real motive.* Teachers in many progressive schools in Grand Rapids, St. Louis, and other cities, have discontinued daily oral-reading exercises above the third grade. Daily silent-reading exercises have been adopted in their place. Frequent opportunities for oral reading are provided, however, in the various school subjects, in morning exercises, and in special periods set aside for the purpose.

The teachers are unanimous in their opinion that a few oral readings given under the stimulus of a real motive which calls forth the best efforts of the reader are much more effective and economical than many formal oral-reading exercises of the traditional type.

9. *The analysis of polysyllabic words both for content and for meaning should receive emphasis in special drill periods in the fourth, fifth and sixth grades.* Tests in oral and silent reading show clearly that pupils in general are deficient in their ability to analyze words effectively either for meaning or pronunciation. An examination of current courses of study reveals the fact that very little systematic work is done in word analysis. Judd (20) shows that systematic work along this line is very productive. These facts justify the recommendation that more time and attention be given to the systematic study of words.

FACTORS INFLUENCING THE RATE OF SILENT READING

1. *Increasing the amount of attention and thought to the content of what is read decreases the rate of reading.* Courtis (6) secured results which show clearly that one's rate of reading varies with the attention given to the thought of the selection. Whipple and Curtis (35), in an investigation of skimming in reading, found that the rate of reading was decreased if the subjects knew that a reproduction of what was read was required. Gray (12) draws the following conclusion from his investigation of the problem. "A comparison of the rates of silent reading of prose in preparation for answering questions and for reproduction shows that a few individuals read more rapidly in the latter test. . . . In nearly every case they were of the opinion that the reading for reproduction was more rapid than reading to prepare for questions, because they 'rushed through the selection to see what it was about.' "

2. *Familiarity with subject matter increases the rate of reading.* Dearborn (8) found that in the second reading of a selection the reader saved one third the total reading time, diminished the absolute time of nearly every pause, made fewer pauses, and increased noticeably the average distance of the eyes' first pause from the left edge of the page. These facts suggest the desirability of using familiar selections in exercises designed to increase the

rate of reading and the regular rhythmical forward movement of the eye across the page.

3. *The rate of silent reading usually increases as the amount of lip movement decreases.* Hendricks points out that in the first grade there is no appreciable difference between the rates at which lip-movers and non-lip-movers read; in the fourth grade lip-movers read more slowly than non-lip-movers; and in the eighth grade lip-movers read decidedly more slowly than non-lip-movers. Quantz (27), in a study of adult readers, found that the ten slowest readers show almost double the amount of lip movement that the ten most rapid do, while "not one of those whose reading is widest is a lip-mover at any extent which can be observed." Huey (19) agrees with the conclusions cited above, but points out exceptions to the general rule.

4. *Regular rhythmical movements of the eyes are prerequisite to rapid silent reading.* Huey's (19) observations led him to the following conclusions: "Each would fall into a reading pace that seemed most natural to him and would then read page after page in exactly the same time. . . . Habits of eye movement are doubtless important factors in setting this pace." Dearborn (8) supports the same point of view when he says: "It is, in the writer's belief, clearly indicated by the above experiments, that one of the essentials of natural and rapid reading is that the reader's eye should at once be able to acquire a regular and uniform motor habit of reaction for each line."

5. *Ability to assimilate the content of what is read increases the rate of reading.* Ruediger (29) reaches the following conclusions: "The essential factors that determine reading must be looked upon as central rather than peripheral. It is not a matter of getting material to the brain, but of assimilating it after it is there."

6. *Length of words.* Different points of view are held relative to the influence of the length of words on reading rate. Beer states that the reading time varies with the character of the words used. Thus a preponderance of monosyllabic words makes the reading time longer owing to the relatively greater meaning conveyed by monosyllabic words. Messmer reported similar results. Dear-

born (9), in checking the results of Messmer's experiment, says: "It is not the short words as such, but the words which cannot be easily grouped with others which necessitate separate fixation."

7. *Summary of factors.* Quantz (27), considering all the factors which he found to contribute to rapid reading, said that they are in the order of importance: "visual perception; practice as determined by amount of reading from childhood on; power of concentration, mental alertness, estimated by rapidity of original composition; scholarly ability, as decided by college records."

SUGGESTIONS RELATING TO THE IMPROVEMENT OF RATE OF READING

1. *Short exposure exercises are effective in improving the rate of reading in the lower grades.* Gray (12) reports the result of a short exposure experiment in which sense material, nonsense syllables, digits and groups of the digit zero were used. The period of practice was from fifteen to twenty minutes per day for twenty days. Gray's results led to the following conclusions: "It seems that positive results can be obtained if the training is undertaken as early as the fourth year. In the light of these facts it may be repeated here that without doubt the type of training which is given in primary work by means of the flash cards is a very important element in the early training in reading." Whipple and Gray each secured results which indicate that exercises of the type described above are of little value after the sixth grade.

2. *Short exposure exercises, combined with training in rapid reading, are effective in increasing the rate of reading.* Gray (12) conducted a controlled experiment with a good reader and a poor reader and reached the following conclusions: such training results in marked increases in the rate of reading; the decreases in rate which are to be noted after a lapse of three months do not carry the reader back to the point at which he started before practice; the increase in rate is accompanied by a marked decrease in the number of eye pauses per line.

3. *Speed drills increase the rate of reading, but do not change the effectiveness of reading to any large extent.* Peters (25) draws the following conclusions from an experiment with 207 different pupils in grades three to six inclusive: "This table shows a rela-

tive gain of 18.7 per cent. in speed, but a trifling loss in quality as a result of the speed drills." Gray (12) concludes that short exposure exercises and speed drills increase the rate materially, but do not change comprehension in any material way. Judd (20) reports the results of special experiments in the training of pupils. In each case there was marked improvement both in rate of reading and in comprehension. These facts indicate that training to increase the rate of reading should be accompanied by devices which also give emphasis to the content of what is read.

4. *Skimming in reading increases the rate but may decrease markedly the comprehension of what is read.* Whipple and Curtis (35) concluded from a preliminary investigation in skimming with six adults that skimming is a much more rapid process than normal silent reading, but that when readers are forced to skim at a prescribed and unusually high rate, reproduction becomes very poor and the whole process becomes disagreeable and flurried.

5. *Much reading of simple interesting material is effective in increasing the rate of reading.* Much oral reading of simple material in the second and third grades forms the habits and associations on which fluent reading depends. Much silent reading of relatively simple material in the fourth, fifth and sixth grades is effective, as shown by Oberholtzer (23). Frequent silent-reading exercises, with a limited amount of time in which to complete the reading, tends to break up habits of slow, slovenly reading.

SUGGESTIONS RELATING TO THE IMPROVEMENT OF COMPREHENSION

1. *Knowledge, while reading, that material is to be reproduced improves the quality of the reading.* Peterson (26) found that the attitude which accompanied the reading had a direct effect on both immediate and delayed reproductions of a list of words. In one section immediate reproduction with determination was 14.8 per cent. better than without determination, and delayed reproduction with determination was 48.4 per cent. better than without determination. In a second section the results were still more favorable to the plan of determination. Peterson attributes the superiority of the active attitude with determination to better association as well as to more intense effort.

2. *Ability to reason and to make judgments concerning what is read are essential in effective silent reading.* Thorndike (32) reaches the following conclusions after a careful, analytical study of the errors which pupils make in answering questions about what they have read: "In school practice it appears likely that exercises in silent reading to find the answers to given questions, or to give a summary of the matter read, or to list the questions which it answers should in large measure replace oral reading. The vice of the poor reader is to say the words to himself without actively making judgments concerning what they reveal."

3. *Emphasis of the elements on which meaning depends improves comprehension.* Gray (12) conducted a training experiment with two subjects—one a fourth-grade boy and the other a sixth-grade boy. Both subjects had shown in the oral and the silent reading tests that they were not efficient in comprehension. "The training here consisted in reading selections carefully with a view to emphasizing those elements on which the meaning depended. Such matters were discussed as topic sentences, relational words, effect of different types of modifying phrases, etc." On the basis of the records made by the subjects before and after training, Gray concluded: "Training in comprehension increases the rate of reading. A gain in comprehension is made in two tests by one subject a loss in comprehension is shown in one test by No. 14 and in all tests by No. 27." The negative results in the latter case are attributed by Gray to the adverse attitude of the subject.

Judd (20) reports improvement as a result of training by the following methods and devices. "For special training, paragraphs or selections dealing with topics of particular interest to the pupil were used.....The selections used at first were those predominantly narrative in character, later the informational type was used extensively. Interest in the story strongly motivated the reading.....Silent reading was followed by oral or written reproduction. When the oral reproductions were inadequate, questions were asked and the pupil, if unable to answer, re-read the paragraph. After a chapter had been studied in this way a résumé was made of the main points."

4. *Rapid readers usually read more effectively than slow*

readers. Quantz (27) found that the rapid readers were on the average about 37 per cent. superior to the slow readers in the quality of their work. "The superiority of the rapid reader is also shown by the fact that his memory of the substance of his reading is more exact than that of the slow reader. He introduces only two thirds as many thoughts not found in the original selection." Waldo (33), after plotting the correlation between speed and comprehension for several grades, remarks: "No definite results can be stated, though it would seem that the rapid readers are usually strong in comprehension, although there are many exceptions." Hendricks (18) shows distinct positive correlation between speed and quality of silent reading. "In the percentage of thought reproduced, the rapid readers excel, giving 91 per cent. of the thought as compared with 76 per cent. reproduced by the slow readers." Judd (21) reports the following conclusions based on a study of 1,831 pupils. "These figures serve to emphasize the fact that good readers are usually not slow and poor readers are usually not fast." An unpublished study has just been completed at the University of Chicago, including 9,376 cases, which supports the general conclusions cited above.

5. *For a given pupil the comprehension of what is read decreases as the rate of reading increases above his normal rate.* Whipple and Curtis (35) and Peters (25) concluded from data which they secured that quality of reading is frequently sacrificed, if a given subject increases his rate too much above his normal rate of reading. The natural conclusion from these facts is that comprehension should always be emphasized in exercises which are designed to increase the rate of reading. Pupils should not be urged to read more rapidly than they can read effectively. It is appropriate, on the other hand, to urge pupils to read at their maximal effective rate.

SUGGESTIONS RELATING TO THE HYGIENE OF READING

1. *Size of book.* Smaller books which can be easily held in one hand are preferred. Larger books must usually rest on a support, with the result that the letters are often exposed at an angle, thus greatly lessening their legibility (19).

2. *Texture of paper.* The paper should be of such a quality that the printing on one side will not show through on the other. Furthermore, the printing on one side of the page must be so done that the evenness of the surface of the other side of the page is not affected (19).

3. *Color of the paper.* The paper should be pure white, inasmuch as legibility depends in part on the contrast between the black of the printed letters and the white of their background. Furthermore, the surface of the paper should have no gloss, since a glossy surface is especially trying to the eyes (19).

4. *Color of type.* The printed letters should have sharp, clear-cut outlines and should be deep black (19).

5. *Color of pictures.* The use of highly colored pictures and drawings is questioned by some investigators (9). Experiments indicate that peripheral color stimuli may affect the accuracy of fixation and interfere with the accuracy of the reading movements.

6. *Length of lines.* Investigators (19) generally favor the shorter rather than the longer lines. There is a preference for lines between 60 and 80 millimeters in length, with 90 millimeters as a maximum. Experiments show that lines the length of those in the columns of a newspaper can be read more rapidly per unit than lines of greater length.

7. *Uniformity in length of line.* Huey (19) and Dearborn (9) agree that the lines of a given selection should be uniform in length, because a reader drops quickly into a habit of making a constant number of movements and pauses per line. The acquirement of a uniform motor habit and a certain rhythmical sequence of movements and fixations depends, therefore, very largely on uniformity in the length of lines.

8. *Distance between lines.* A minimal leading of 2.5 millimeters between lines should probably be required (19). Increasing the leading does not seem to help. If the letters are undersize, the extra space should be used in increasing the size of the letters. The distances between lines (leading) recommended (30) as standards for the first four grades follow: first grade, 4.5 mm.; second and third grades, 4.0 mm.; fourth grade, 3.6 mm.

9. *Size of type.* Investigators (19) are generally agreed that

eleven-point type, about 1.5 millimeters in height for the short letters (m, n, o), should be made a minimum. Material printed in this size of type is read faster and individual words recognized more quickly than when the type is smaller. The heights recommended by Shaw (30) as standards for the first four grades are: first grade, 2.6 mm.; second and third grades, 2.0 mm.; fourth grade, 1.8 mm. These standards have been generally adopted in America. A report (10) issued by the British Association in 1913 on the influence of schoolbooks on sight recommends that type should conform to the following requirements for the ages given: under 7, 3.5 mm.; 7 to 8, 2.5 mm.; 8 to 9, 2.0 mm.; 9 to 12, 1.8 mm.; over 12, 1.58 mm.

10. *Thickness of the vertical stroke.* The letters should stand out clearly and distinctly (19). The thickness of the vertical stroke should not be less than 0.25 mm., and 0.3 mm. is preferred by some. Roethlein (28) concluded from her experiments that the relatively heavy-faced types prove to be more legible than the light-faced types, and that the optimal heaviness of face seems to lie in a mean between the bold faces and such light faces as Scotch Roman and Cushing monotype.

11. *Space between vertical strokes.* The vertical strokes within a letter should be from 0.3 to 0.5 mm. apart; the vertical strokes of adjacent letters should be from 0.5 to 0.75 mm. apart.

12. *Space between letters.* Huey (19) states that a minimum of six or seven letters per running centimeter is a convenient approximate gauge.

13. *Space between words.* A distance of 2.0 millimeters between words has been generally accepted.

READING TESTS

Brown's Silent Reading Tests. These tests include three selections which are simple stories designed for use in testing silent-reading ability in all grades. The tests are approximately equal in difficulty, and they can be used at different periods of the year to measure progress. The tests measure the rate of reading and a pupil's ability to reproduce what has been read. (Price \$0.50 a hundred.) Address H. A. Brown, State Normal School, Oshkosh,

Wisconsin. Read *Bulletin No. I of the Bureau of Research of the New Hampshire Department of Public Instruction*, Concord, New Hampshire.

Courtis' Reading Tests. These are the first of a series of tests designed to measure various phases of silent reading ability. Each test consists of two parts. In the first part the children read a simple story under normal conditions. This yields a record of the rate of reading. For the second part of the test, the paragraphs of the story are reprinted, and under each are given five simple questions which are designed to measure the child's understanding of what has been read. The scores have diagnostic value and enable a teacher to determine in a fairly comprehensive way the nature of the pupil's defects. The tests are suitable for Grades I to VI. They are available in two forms of nearly equal difficulty, so that measurements may be made at the beginning and end of the year. (Price, including instructions, record sheets, etc., for a class of forty children, \$0.85.) Address Courtis Standard Research Tests, 82 Eliot Street, Detroit, Michigan. Read "Measurement of Ability in Silent Reading," by S. A. Courtis, *American School Board Journal*, May, 1917.

Fordyce's A. Scale for Measuring Achievements in Reading. This test is designed to measure rate and quality of silent reading. Test No. 1 is for Grades III to V; Test No. 2 is for Grades VI to IX. Practice exercises have been prepared which include four series of groups of words to be grasped and interpreted as units. (Prices: Test 1 or 2 complete with record sheets and directions, \$1.25 for 100 pupils if the practice exercises are included; \$.75 for 100 pupils without the practice exercises.) Address the University Publishing Company, Chicago, Illinois.

Gray's Reading Tests. The oral-reading test consists of a series of standardized paragraphs arranged in the order of increasing difficulty. This test may be used to measure the achievement of pupils of all grades in the mechanics of oral reading. The silent-reading tests consist of a series of three selections, the first for pupils of the second and third grades, the second for pupils of the fourth, fifth, and sixth grades, and the third for pupils of the seventh and eighth grades. These selections may be used to mea-

sure the rate at which pupils read silently and their ability to reproduce and to answer questions concerning what they have read. These tests are individual tests rather than group tests and are designed for careful detailed studies of reading ability. (Oral-reading tests with directions and score sheets, \$0.50 a hundred; silent-reading tests, \$0.50 a hundred; postage or express extra; state number wanted for each grade when ordering.) Address William S. Gray, School of Education, University of Chicago, Chicago, Illinois. Read *Studies of Elementary-School Reading through Standardized Tests*, by William S. Gray.

Jones' Scale for Teaching and Testing Elementary Reading. This test consists of a list of words which have been found to occur most frequently in ten or more widely used primers. "These tests will aid to discover a pupil's command of the vocabulary common to first-, second-, and third-grade readers." (Material sufficient to test 100 pupils consists of the following at the prices quoted: one teacher's manual \$.25; twenty sight and phonetic charts \$1.00; ten phonetic test cards \$.50; 10 sight test cards \$.50; total \$2.25; postage extra.) Address R. G. Jones, 1453 Marlowe Avenue, Lakewood, Ohio. Read *Fourteenth Yearbook, Part I*, pp. 37-43.

The Kansas Silent Reading Tests. These tests consist of three carefully graded groups of exercises for silent study, one for the primary grades, one for the grammar grades, and one for the high school. Comprehension is measured by the accuracy with which the questions which appear in the exercises are answered. The pupil's ability to read is measured by the number of exercises which he can comprehend accurately within a given time. Test I is for Grades III, IV, and V; Test II for Grades VI, VII, and VIII; Test III, for Grades IX, X, XI, and XII. (Price, including directions and record sheets, \$0.50 a hundred.) Address Bureau of Educational Measurements and Standards, Kansas State Normal School, Emporia, Kansas. Read "The Kansas Silent Reading Test," by F. J. Kelly, *Journal of Educational Psychology*, February, 1916.

Minnesota Tests in Reading. The "Visual Vocabulary" test appears in two parts. The first, for Grades I and II, includes sight and phonetic words. The second is called "Scale R 2," and con-

sists of a series of words for Grades III and IV, and another for Grades V to VIII. The "Understanding of Sentences" is called Scale Beta and includes a series for Grades III to V and another for Grades VI to IX. Address the Northwestern School Supply Company, Minneapolis, Minn. Visual Vocabulary, for Grades I and II, Phonetic or Sight cards (either) \$.001½ each; record sheets \$.011½ each; score sheets \$.03 each; directions \$.011½ each; Scale R 2, either series, \$.001½ each; record sheet \$.011½ each; directions \$.02 each (contain directions also for Scale Beta). Understanding of Sentences, Scale Beta, either series, \$.75 a hundred; record sheets \$.011½ each; directions \$.02 each (contain directions also for Scale R 2).

Monroe's Standardized Silent Reading Test. These tests are a modified form of the Kansas Silent Reading Tests. They are superior to the Kansas tests, inasmuch as the exercises are more uniform in character and have been secured from materials which children commonly read. There are three tests in the series. The first is for Grades III to V; the second for Grades VI to VIII; and the third for Grades IX to XII. Each of the three tests is available in three forms of approximately equal difficulty. (Price, including directions and record sheets, \$.50 per hundred, postage extra.) Address Walter S. Monroe, Indiana University, Bloomington, Indiana. Read, "Monroe's Standardized Silent Reading Test," *Journal of Educational Psychology*, June, 1918.

Price's Scale for Testing Oral Reading. This test consists of a series of passages, one for each grade, measures the rate of reading and secures a record of the types of errors made while reading. Address E. D. Price, Enid, Oklahoma. Write for price.

Starch's Silent Reading Tests. These tests consist of a series of selections, one appropriate for each grade in the elementary school. They are designed to measure speed and comprehension in reading for Grades I-VIII. Two sheets are required for each pupil. (Price, \$.45 per hundred. Directions \$.01 each. When ordering, specify the number of pupils to be tested in each grade.) Address University Supply Association, Madison, Wisconsin. Read "The Measurement of Efficiency in Reading," by Daniel Starch, *Journal of Educational Psychology*, January, 1915.

Starch's English Vocabulary Test. This test is designed to supplement the silent-reading tests and to measure the range of a pupil's reading vocabulary. For Grades V-XII. (Price, \$.45 a hundred. Directions, \$.01 each.) Address University Supply Association, Madison, Wisconsin.

Thorndike's Improved Scales for Word Knowledge or Visual Vocabulary, Scale A2 and Scale B. These scales consist of series of words which must be defined by the reader. The class to which each belongs is indicated by writing "the letter *F* under all words that mean a flower, *A* under all words that mean an animal," etc. The scales are used to measure the ability of pupils to recognize the meanings of words seen. They are printed on four sheets: Scale A2, x series; Scale A2, y series; Scale B, x series; and Scale B, y series. (Price, \$0.40 a hundred; \$3.00 a thousand of any one kind. Postage extra. Sample set, \$0.06 by mail.) Address Bureau of Publications, Teachers College, Columbia University, New York City. For derivation, use, and scoring of these scales see "The Measurement of Achievement in Reading: Word Knowledge," by E. L. Thorndike, *Teachers College Record*, November, 1916. (Price, \$0.40.)

Thorndike's Improved Scale for Measuring the Understanding of Sentences, Scale Alpha 2. This scale consists of carefully graded paragraphs, each of which is accompanied by a series of questions, the answers to which must be determined as the pupil reads and studies the paragraph. The purpose of the test is to measure the pupil's ability to understand the meaning of sentences and paragraphs. Part I may be used for Grades III-V; Part II for Grade VI to the high school. (Price, each part, \$0.75 a hundred. Record sheets, \$0.25 a dozen. Postage extra. Sample set, both parts and record sheet, \$0.08 by mail.) Address Bureau of Publications, Teachers College, Columbia University, New York City. For derivation, use, and scoring of this scale see two articles on the "Improved Scale for Measuring Ability in Reading," by E. L. Thorndike, *Teachers College Record*, November, 1915, and January, 1916. (Price, \$0.80 for both numbers.)

REFERENCES

(The following bibliography includes only those references which have been quoted or referred to in the foregoing chapter.)

1. Bliss, D. C. Standard tests and a basal method of teaching reading. *Elementary School Journal*, XVIII, June, 1918.
2. Boggs, Lucinda. How children learn to read. *Pedagogical Seminary*, XII, 1905.
3. Bowden, Josephine. Learning to read. (Master's Thesis. The University of Chicago) 1911.
4. Cattell, J. M. *Mind*, 1886.
5. Currier, Lillian B. and Duguid, Olive C. Phonics or no phonics. *Elementary School Journal*, XVII, Dec., 1916.
6. Courtis, S. A. Standards in rates of reading. *Fourteenth Yearbook, Part I*, 1915.
7. Courtis, S. A. Standard tests in English. *Elementary School Journal*, XIV, April, 1914.
8. Dearborn, W. F. The psychology of reading. *Columbia Contributions to Philosophy and Psychology*, XIV, No. 1, (1906).
9. Dearborn, W. F. *The Psychology of Reading*.
10. Drummond, W. B. *An Introduction to School Hygiene*. Chap. IX.
11. Gill, Edmund J. Methods of teaching reading. *Journal of Experimental Pedagogy*, I, March, 1912.
12. Gray, C. T. Types of Reading Ability as Exhibited Through Tests and Laboratory Experiments. *Supplementary Educational Monographs*, Vol. I, No. 5.
13. Gray, William S. Studies of Elementary School Reading Through Standardized Tests. *Supplementary Educational Monographs*, Vol. I, No. 1.
14. Gray, William S. The relation of silent reading to economy in education. *Sixteenth Yearbook, Part I*, (1917).
15. Gray, William S. "Reading." Survey of the St. Louis Public Schools. Vol. II, Part 4.
16. Gray, William S. The use of tests in improving instruction. *Elementary School Journal*, XVIII, June, 1918.
17. Harris, J. H. and Anderson, H. W. *Measuring Reading in the Dubuque Schools*. Ginn and Company.
18. Hendricks, E. L. *A Study in Reading*. Silver, Burdett and Company.
19. Huey, Edmund B. *The Psychology and Pedagogy of Reading*.
20. Judd, Charles H. Reading: Its Nature and Development. *Supplementary Educational Monographs*, Vol. II, No. 4.
21. Judd, Charles H. Measuring the Work of the Public Schools. Cleveland Education Survey Reports.
22. McLeod, L. S. The Influence of Increasing Difficulty of Subject-Matter upon Rate, Errors, and Comprehension in Oral Reading. (Master's Thesis. The University of Chicago.) 1917.
23. Oberholtzer, E. E. Testing the Efficiency in Reading in the Grades. (Master's Thesis. The University of Chicago.) 1915.
24. Oberholtzer, E. E. Testing the efficiency in reading in the grades. *Elementary School Journal*, XV, Feb., 1915.
25. Peters, Charles C. The influence of speed drills upon the rate and effectiveness of silent reading. *Journal of Educational Psychology*, VIII, June, 1917.

26. Peterson, Joseph. The effect of attitude on immediate and delayed reproduction. *Journal of Educational Psychology*, VII, Oct., 1916.
27. Quantz, J. O. Problems in the Psychology of Reading. *Psychological Review Monograph Supplements*, Vol. II, No. 1, (Dec., 1897).
28. Roethlein, B. E. The relative legibility of different faces of printing type. *American Journal of Psychology*, XXIII, Jan., 1912.
29. Ruediger, W. E. Field of distinct vision. *Columbia Contributions to Philosophy and Psychology*, Vol. XVII, No. 1, (1907).
30. Shaw, Edward R. *School Hygiene*.
31. Starch, Daniel. The measurement of efficiency in reading. *Journal of Educational Psychology*, VI, Jan., 1915.
32. Thorndike, E. L. Reading as reasoning: a study of mistakes in paragraph reading. *Journal of Educational Psychology*, VIII, June, 1917.
33. Waldo, Karl D. Tests in reading in Sycamore schools. *Elementary School Journal*, XV, Jan., 1915.
34. Whipple, G. M. The effect of practice upon the range of visual attention and of visual apprehension. *Journal of Educational Psychology*, I, May, 1910.
35. Whipple, G. M. and Curtis, Josephine N. Preliminary investigation of skimming in reading. *Journal of Educational Psychology*, VIII, June, 1917.

CHAPTER III

PRINCIPLES OF METHOD IN TEACHING SPELLING AS DERIVED FROM SCIENTIFIC INVESTIGATION

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INTRODUCTION

There is perhaps no subject in the course of study to which general experimentation in psychology and special experimentation in the subject itself have contributed more than in the case of spelling. Moreover, there is probably no other subject for which the results of teaching can be checked with such peculiar ease and certainty. And yet, although spelling has occupied a considerable portion of the time allotment in the public schools (15, 56, 71, 93),* investigators have generally charged that the results have been poor (9, 32, 93, 100, 109, 117, 120). This inefficiency does not seem to be a recent matter, as some of the lay critics believe. As a matter of fact, the two studies which compare by actual tests the spelling of recent times with that of an earlier period, seem to show that pupils spell considerably better than they did in the days of our grandfathers (94-117).

One may wonder why, in the face of the great amount of experimental data bearing on the teaching of spelling, there has not been greater improvement in practice. A part of the difficulty is no doubt due to the fact that the experimental data have been in technical form and have not been accessible, either to the classroom teacher or to the supervisor. In harmony with the purpose of the other studies in this *Yearbook* it is the intention of this chapter to gather together existing experimental evidence which throws

*Numbers in the body of the text refer to the bibliography at the close of the chapter.

light on economy in learning to spell, and to focus this evidence upon the solution of such problems as confront the classroom teacher. The appended bibliography contains the references from which these data have been secured. It is not exhaustive of all investigations which relate to spelling, but is meant to contain the more important studies. No references are made to any study which is not available in English, at least in a summary form. In the desire to bring the summary of the evidence up to date, reference is made to a number of investigations which as yet are in manuscript form only.

The first need is the recognition that *there is no short cut to spelling*. The present short-comings in teaching are due, not only to the causes enumerated above, but also to our attempts to discover short cuts, and to our lack of specific attack on the problem. A few of these tendencies may be warned against particularly in the first of the "principles."

THE PRINCIPLES

1. *Do not depend solely upon the incidental teaching of spelling.* Some have urged this teaching on the basis of economy of time, since such a method apparently saves the time usually given to the spelling period. Actually, however, this time is distributed among other subjects, such as composition, in order that spelling may be taught in connection with these subjects (88, 108). Another reason given for the advocacy of incidental spelling has been a theory of interest which has assumed that clean-cut drill for the purpose of increasing skill or fixing knowledge is not interesting; but that vital interest is supplied by having spelling made a part of composition and other subjects. The more careful study which spelling has received in the last few years has shown that, as a matter of fact, neither of these two assumptions is true. On the one hand, the frequent complaint of teachers of composition at every stage of the child's progress is that he is not sufficiently interested in spelling. On the other hand, those who have conducted experiments in drill, have reported uniformly a marked interest in the drill exercises, regardless of the sort of drill employed.

The tendency to rely on incidental teaching was augmented

by the wide-spread publicity given to the studies of Rice (93) and Cornman (32) as well as by a general dissatisfaction with the results ordinarily obtained through unskilled formal teaching. For example, Cornman, as a result of his investigation, concluded that the results obtained in incidental spelling, while not all one could wish, were as satisfactory on the average as could be expected from direct teaching. Wallin (117), in criticising Cornman's conclusion, points out that while this might be true of most direct teaching, it was not true of such teaching as is possible under competent direction. He cites the results obtained in Cleveland (1910) in proof.

In addition to the objections urged by Wallin, it has been pointed out that spelling is not actually taught incidentally save by exceptional teachers. Lately, it has become more and more apparent that incidental teaching of spelling is not a substitute for direct instruction, even in the case of the exceptional teacher. The experiments by Winch (122) seem to show that indirect teaching (using words in sentences, calling attention to rule, different parts of words, etc.) is not so efficient as direct instruction, either in guaranteeing the future use of words or in securing correctness of spelling. One experiment showed that even with twice as much time given to learning, the results obtained by the indirect method were inferior. This method called by Winch "indirect" is really much more systematic than the ordinary haphazard efforts which go by the name "incidental instruction."

2. *Developing pride in spelling is not a substitute for drill in spelling.* There can be no doubt that such attitudes as make up conscientiousness in spelling are substantially beneficial (74). It is only when they are urged as a substitute for direct spelling instruction that they are detrimental. Evidence collected by McFarland from students in elementary school, high school, and college, indicates rather clearly that one's 'spelling conscience' is subject to the limitations imposed by lack of spelling ability (75). It is clear that conscience operates within the limits of knowledge and training. At no age does the student's judgment as to what words he can or can not spell seem sufficiently accurate to warrant advising that direct spelling instruction should be abandoned. Accord-

ingly, while a teacher should encourage pride in accurate spelling, she must remember that it must be the function of this painstaking work to reinforce rather than to replace direct instruction.

3. *Rules cannot replace direct instruction in spelling, even in the case of words covered by them.* A third influence which has operated to prevent efficient spelling has been too much reliance on spelling rules (93, 108). Most of the articles dealing with the subject contain a peculiar fallacy, namely, that by discovering what words are covered by a given rule, one may discover the efficiency of teaching that rule (72, 73, 96). As a matter of fact, one must show in addition to the above that the rule can be easily taught, that it will be remembered, and that it will function in the stress of actual spelling. Evidence seems to cast a doubt on all three of these assumptions. The experiments on this point are not wholly conclusive, but are, with one exception, in agreement (31, 96, 113, 121). Moreover, Rowland's study (96) which constitutes the one exception, did not include a check group by which to show that the results obtained were due to the teaching of rules. Even the favored rule for *ie* and *ei* failed to show, upon careful investigation including nearly two thousand pupils, that time spent in learning the rule was as efficiently spent as in directly attacking each word to be learned (121).

It is desirable that someone investigate the result of teaching rules to the point where they are fixed and their use habituated. At present it would appear that either because the rules are not properly taught or because they are not remembered or because they do not function when needed or because the words covered by them are too few and the exceptions too numerous—for one or all of these reasons results have not been satisfactory. In the light of present evidence one seems to be justified in recommending that the teaching of rules be abandoned until more conclusive evidence is presented to show that the time spent in teaching them is as productive of efficiency as the same amount of time spent in teaching the words directly.

4. *Up to the present time the effect of the movement for simplified spelling has been to complicate the problem rather than to*

*make it easier to solve.** Until the program of simplified spelling has been adopted much more widely, we can not expect much aid from this source (12, 27, 33).

Summarizing the evidence on the incidental teaching of spelling, on relying wholly on pride in spelling and on the use of rules, the indications are that efficiency in teaching spelling is to be increased by a specific attack on the individual words to be learned. This is in line with the whole tendency in modern experimental education, a tendency which has been well outlined by Thorndike in his discussion of education as the formation of specific bonds (112). In harmony with this point of view the problem of spelling has been attacked: first, by seeking to discover precisely the words which we most frequently need to spell; second, by attempting to grade these words scientifically; third, by attempting to discover the most economical methods of learning them, and fourth, by devising means by which progress in learning the words may be measured.

5. *The first step in economy of time in learning to spell is to see that the pupil learns those words which he needs to spell and no others.* This work has been attempted in a number of investigations, such as those by Ayres (10), Anderson (3), Cook and O'Shea (31), Horn (59, 60), Houser (62) and in the California Speller (81). These studies all attempt to discover what words the pupil will need in writing in life outside the school—correspondence being assumed to be the most common need for spelling. The studies by Pryor in the *Fourteenth* (90) and in the *Sixteenth* (91) *Yearbooks of this Society* represent a compromise with practice, but a move in the right direction.

It is clear on the one hand that there can be no economy in teaching words which the child does not need to spell, no matter how efficient the method of teaching may be. It is clear on the other hand that it is inefficient to fail to teach the child some word which he frequently does need to spell. Accordingly, these studies determining the essential vocabulary in spelling have taken the first step in insuring economy in learning this subject. A com-

*As for example in the treatment of *ough* and *ed*.

posite list including nine investigations which have been made of correspondence vocabularies has been compiled by the author (60). This list contains 4,052 words which appear with a frequency of four or more, on the basis of approximately 700,000 words tabulated. The scientific accuracy of the compilation is marred owing to variations in the method by which the original studies were made, and to the impossibility of determining from these studies or by correspondence some of the data needed for a completely satisfactory compilation. It is the judgment of the author, however, that the resulting word list is for all practical purposes a fair summary of these studies and should be used as the basis of spelling instruction in the elementary school until more elaborate investigations are made.

After the words to be taught in the elementary school have been selected, the next problem in promoting efficient teaching is to determine the grade in which each word should be taught. The principles which have been most urged of late, as a basis of grading the course of study in spelling are here given as Nos. 6 to 11.

6. *Those words which are most difficult should be presented in the more advanced grades.*

The Ayres scale (11) has operated to grade the course of study in spelling according to this principle. It should be pointed out, however, that the frequency with which a given word is misspelled in a given grade does not necessarily indicate under present conditions, the difficulty of learning that word.

7. *Those words which are commonly used by the children in any given grade should be placed in that grade.*

This is the principle of grading recommended by Jones (66).

8. *Those words which are most commonly used in correspondence should be taught earliest, on the ground that the school must insure the correct spelling of such words before the elimination of pupils becomes serious.*

9. *Those words needed in other subjects should be taught in appropriate grades.*

For example, the teaching of *subtrahend* should be done in the grade in which the definition of the term is required in arithmetic.

Less often the two following principles have been urged:

10. *Words should be graded according to their length.*

11. *Words should be graded according to phonic progression.*

Principles 6, 7, and 8 seem to the writer to state what is essential for determining the word list for any grade. Naturally, under our present system of grading, with the great amount of over-lapping between adjacent grades, there can be no cast-iron limitations as to the grade in which a word is placed.

We may now pass to an examination of the factors which make for efficiency in the actual learning of the words that have been selected for a given grade. For convenience, the rules are grouped according to their bearing on one or the other of two classes of problems. First, those which are chiefly concerned with the efficient conduct of the recitation, (Rules 12 to 26), and second, those which deal with the most economical methods by which a child may learn a given word (Rules 27 to 40).

12. *While the number of words to be taught per lesson depends on the method to be employed and upon the length of the recitation, the tendency in recent years has been to decrease the number.*

This tendency is seen as early as in the studies by Wallin (116, 117). Most of the recommendations have been based upon indirect evidence from studies of the memory span (38, 118, 119). For example, studies such as those by Ebbinghaus show that time for learning is more than proportionately increased as the number of items per group is increased. Another influence which has tended to decrease the number of words per lesson is the decrease in the number of words which the child is expected to know by the end of the elementary school period. If one is to have spelling daily in grades from II to VIII, and if one is to teach but a thousand words, then an allotment of two words a day would give unusually abundant opportunity for reviewing a word in order to insure that it be remembered.

On the basis of 38 weeks per year, which is slightly less than the average given by Holmes for the length of the school year in fifty cities (56), two new words a day in Grades II and III; three new words a day in Grades IV and V; and four new words a day

in Grades VI, VII, and VIII would provide for teaching 4,180 words. This more than takes care of all the words occurring in the composite list (60) with a frequency of four or more on the basis of 700,000 running words.

But even if only 4,000 words are to be taught by the end of Grade VIII, one has still to choose between teaching a small number of new words on each day and a larger number of words, say on Monday, with no new words until these are learned. For example, if twenty new words are to be taught each week, one may teach four new words on each day of the week or teach twenty words on Monday, reviewing these twenty words on each of the succeeding four days. Still other arrangements are, of course, possible.

While, as indicated, it is impossible to advise finally concerning the number of words to be taught per lesson without knowing the conditions, the author's own preference, based on two preliminary experiments, is to test over a large number of words at a time (twenty-five to fifty according to grade) and then use as many periods as are necessary for each pupil to learn the words he has missed. By this method it is apparently quite possible to teach words from the Ayres list (Columns R-V) to sixth-grade pupils at the rate of fifty a week with a median accuracy of from 95 to 100 per cent.

13. If spelling is taught daily, the periods should not be more than fifteen minutes in length.

The median time allotments for eighty cities investigated in 1914 were as follows: Grade I, 50 minutes; Grades II to IX, 75 minutes per week (71). This is slightly less than that given by Holmes in the *Fourteenth Yearbook* (56) in his study of fifty cities. The earlier studies by Rice and Cornman and the various surveys, especially those of Oakland, California (100), the recent measurements in New York City (82) and the studies by Theisen (109) have shown rather uniformly that schools with large time allotments have not secured proportionately superior results and in many cases have not secured results which were superior in any degree. The amount of time required depends somewhat upon the method, but it should certainly not exceed seventy-five minutes per week. This allotment should provide for both study and recitation.

14. The recitation period should be a learning period.

Too often the spelling period is given over to merely hearing the lesson and constitutes not a teaching but a very wasteful test exercise. Classes taught under experimental conditions have indicated the superiority of study done under direction in the actual class recitation period (61, 79, 86, 95, 118, 123). As already implied, no additional study is necessary, either at school or at home, in case the spelling period is administered in this manner.

15. Test all words before teaching.

This will make it possible for each pupil to work on those words which he has missed. Pupils vary so widely in their ability to spell the words of a given lesson that to teach each child each word involves a great loss for all. In a recent experiment with sixth-grade pupils (95) this variation in the ability to spell and learn a given list was so great that the waste from teaching each child each word would have amounted to over 75 per cent. The words selected for teaching were chosen, moreover, by columns in the Ayres scale, and hence were of supposedly equal difficulty. The part of the experiment which included Column T on which sixth-grade pupils are supposed to score 66 per cent, is characteristic of the variation shown. Although the children were tested on this list four times in a month, and each child was credited with an error if he missed a word on any one of these four tests, the percentage obtained by dividing the product of the number of words times the number of pupils into the number of words missed on all tests by the various pupils was but twenty three. This means that with the most perfect teaching and with the most inspiring personality that could be secured, a lesson in which each pupil studies each of these words could not avoid wasting more than 75 per cent of the time of the class.

16. Accordingly, better provision should be made to insure that each child work on his own special difficulties and on no others.

There is clearly no economy in requiring a child to spend time on words which he now can spell correctly and which he will continue to spell correctly in any number of consecutive trials. The only reason for hesitating to adopt a thorough-going plan of individual instruction in spelling is the difficulty of administration, and

this problem is not by any means beyond solution. Experiments conducted in elementary grades during the last two years have convinced the author that this is the most important factor in securing better spelling.

17. *Contrary to what is often said, initial errors made on these preliminary tests do not persist.*

Reasoning from the importance of primacy in habit formation, writers on spelling have long made a point of the importance of avoiding misspellings (108). If test errors tend to persist, the tendency is apparently offset by immediate correction. The resulting feeling of dissatisfaction at having missed the word, plus the concentrated attack on remedying the exact difficulty, more than out-weighs any disadvantage rising from the initial misspelling (46, 61, 95).

Suddards reports an interesting attempt made in an English school to prevent errors by having the children dictate oral compositions to teachers who wrote them on the board to be copied later by the pupils. Even then errors crept in, although the investigator reports the plan with favor (107).

18. *The teacher may develop the meaning of words before testing or teaching.*

This is expensive in time and is unnecessary for most pupils, if the words are properly graded. Hollingworth reasons, although on insufficient grounds, that meaning is "in and of itself a factor in eliminating errors in spelling" (55). What her data really show is that there is a relation between meaning and errors. This relation may be the result of a previous experience with the word which affects both the ability to define and the ability to spell. The most probable value in teaching the meaning of words is that one may more nearly guarantee the continued use of the word in the future and so give practice in spelling. To get this effect, however, the meaning must be developed more thoroughly than is usually the custom where definitions, or sentences, are required (13). Sewell concludes that particular stress should be put on colloquial definitions (101).

19. *Grouping words is of doubtful value, except for immediate recall.*

Grouping according to rules is a special case under the general principle of grouping and has been discussed in the preceding discussion. Data given by Pearson seem to show that homonyms were more efficiently taught together, but that the advantage for such a method was slight (85). Grouping by type of error seems to have some merit in teaching words selected because of their similarity in type of error, but there is a tendency to include in such groupings, words which need not be learned at all (99, 115, 133). Moreover, any advantage which exists for grouping is for immediate, rather than for delayed recall (5). In general, one seems justified for administrative and other reasons, in saying that the time of both the pupils and the teacher will be conserved by regarding each word as an individual problem.

This same principle applies to teaching the derivations of a word. There has been an unfortunate assumption in some quarters that an apparently slight change in the form of a word constitutes no new spelling difficulty. There has also been a tendency to guess as to whether a given derivation constituted a special problem. Investigations have shown that derivations are practically always more difficult to spell than the forms upon which they are built (8).

20. Each child should give special attention to those words which are repeatedly missed by him.

Considerable attention has been given to this problem since the publication of Jones' list of "One Hundred Spelling Demons" (66). In some schools such a list has been taught in all grades above the first, on account of the assumed likelihood that the words in this list would be missed by all children. If lists of difficult words are to be given to all children in a grade, they should be made up according to the difficulty of the words in that grade. Lester has shown that the "Demons" for maturer students are not the same as for pupils in the lower grades and this has been substantiated by other investigators (34, 72, 132). The various spelling scales represent the best measures of the precise difficulty of words in a given grade, but of course they do not indicate whether or not a word is used by pupils in that grade. The data as to the use of words by pupils are supplied in lists like that for New Orleans (80). The great variability shown by a given class in

spelling any list of words would seem to indicate that it is more economical to have each child record and learn the particular words which give him difficulty.

21. *Children who learn to read by a phonic method seem to have no advantage in learning to spell.*

Gill found that in the early grades these children are a little more certain on initial letters and on vowels, but that this is offset by their tendency to leave out more silent letters and to insert letters (45). These tendencies must be taken into account by those who would correlate spelling with phonic methods of teaching reading.

22. *The teacher must expect erratic spelling; she must not expect a single correct spelling or a single misspelling to be a sufficient measure of the ability of the child.*

A word may be missed and then spelled correctly without further drill, or spelled correctly two or three consecutive times and then missed. Where children are tested on the same words with long periods intervening a considerable percentage will change their spellings (6, 34, 20, 115). This is an important point to keep in mind in determining drill and in administering and interpreting tests.

23. *Teachers must expect considerable variability in the spelling ability of pupils in a given class.*

Girls consistently spell better than boys, and this difference increases with grade. This superiority has been reported to be from three to as much as ten per cent. (6, 82, 100, 109, 110, 122, 123). The older pupils in a grade may be expected to make a poorer showing than the younger (82). Pupils who are physically strong are likely to prove superior to their less robust classmates (35, 103). The average for children of foreign parentage may be expected to be slightly less than that for children of native parentage (82, 100). There seems to be some variation among vocational groups (100), and according to family (37, 111). As might be expected, this variability also manifests itself in considerable over-lapping of adjacent grades and even of grades further removed. Accordingly, the teacher must keep in mind the unreality

of the 'fourth-grade child' in spelling (7, 11, 21, 82, 100, 105, 109, 110).

24. *The methods which are suitable for the good speller are apparently also suitable for the poor speller.*

Aside from the limitations of defective vision, hearing or other physical defects, the requirements for the poor speller seem to differ in quantity of drill rather than in kind (55, 58, 83). Special administrative devices may be adopted as in the case of the "Spelling Hospital" described by Charters (26), but the method of learning remains the same.

25. *Students of less than average (but not subnormal) intelligence as measured by Terman's Scale may show no inferiority in ability in learning to spell.*

It is true that investigations of relations between spelling ability and general ability have reported positive correlations (63, 100), but a year's teaching of a sixth-grade class in which pupils of superior, average, and inferior intelligence (as measured by the Stanford revision) had the same learning practice, showed that the children of inferior intelligence, (not feeble-minded) profited as much from this training as children of more than average intelligence (58). This experiment, while not conclusive, raised in the mind of the experimenter the question as to whether a part of the poorer showing which, according to various surveys, children of inferior intelligence have made, has not been due, in part, to inferior methods of learning.

26. *Insist on careful spelling in all written work and religiously correct spelling errors.*

It does not suffice merely to mark the errors. The pupil must be led to regard errors as serious and should learn thoroughly the words which he misses (15, 114, 130).

Aside from misspellings due to insufficient learning experience with a word, *there are other influences which may cause it to be misspelled in context.* Such influences as the following are commonly pointed out: copying the end of the preceding word; including the first syllable of the following word; transposition; doubling the wrong letter; substituting letter or letters of like or approximate phonic value, as, *grate* for *great*; the influence of

another language, in the case of children of foreign parentage (25, 32, 49, 55, 131). The last-named influence represents a special problem, particularly where pupils speak English poorly, and cannot be discussed within the limits of this report. Most of the other influences are to be classed under the heading of "lapses" (17). No experimental data were found to show how these lapses could be obviated.

27. *The emphasis in presenting the word should be upon visual imagery.*

Not only have studies of types of imagery shown that children of the elementary school period are predominantly visual (28, 29, 40, 52), but the direct investigation of the relative efficiency of various methods of learning to spell has quite uniformly revealed that visual presentation is an essential part of methods which give superior results (1, 24, 51, 70, 118, 127). Poor spellers are relatively deficient in using visual imagery (64).

28. *The correct pronunciation of a word is a very important factor in learning to spell it.*

In pronouncing the word the syllables should be enunciated distinctly (1, 23, 29, 118, 130). Investigations do not indicate conclusively whether the pronunciation should be aloud or in a whisper. A choice between these two methods of pronunciation may be determined for the present by administrative convenience. A brief, vigorous drill on the exact pronunciation with emphasis upon the distinct enunciation of all syllables will be worth while.

29. *With elementary-school children it is apparently of advantage to present spelling lessons in script rather than in print.*

This may be because the child's judgment of his own writing is made on a script basis. At any rate, the results of investigations on this point agree in assigning some superiority to the presentation of words in script (19, 23). For typists this advantage would not be expected to hold.

30. *The word should be presented without diacritical marks.*

Reasoning from general psychology, one might expect that such marks would be detrimental to forming the correct image of the word. The experiments of Abbott, while not fully conclusive, at least cast a doubt on the wisdom of using diacritical marks in

the teaching of spelling (1). On this point there have been sharp differences in practice. Miss Wolfe's study shows this interestingly (128).

An examination of sixty-one texts published from 1800 to 1917 showed the following percentage of distribution:

1. Syllabication only	38.3
2. Syllabication, diacritics, accents	20.00
3. Syllabication and accents	20.00
4. No division	21.7

In the twelve texts published since 1907, the presentation is as follows:

1. Syllabication only	33.3
2. Syllabication, diacritics, accents	8.3
3. Syllabication and accents	16.7
4. No division	41.7

An examination of courses of study and book adoptions shows that the syllabic presentation with diacritical and accent marks is the most commonly used form, but that there is a tendency in the direction of undivided presentation.

One might question the advisability of using diacritical marks on the ground that it interferes with habituating the pupil in the use of the dictionary. Dictionaries present the word without diacritical marks; each word is followed with a key to the pronunciation, in brackets.

31. Stress on the syllabication of words is an important element in learning to spell.

This seems particularly true where the stress is by means of the pronunciation of the syllables. Unfortunately, most of the experiments have not distinguished between the separation of the word in visual presentation and the indication of syllabication through pronunciation (1, 53, 128). It seems possible that dividing the word into syllables in the visual presentation does aid younger children in distinguishing syllables clearly and so is beneficial, but a recent experiment by the author failed to show any such advantage.

32. *It does not seem to be worth while to call particular attention to any portion of the word by writing that portion of the word in colored crayon, or by any other device.*

Teachers are often advised to emphasize the part of the word likely to be misspelled and some spelling books have featured this method (18, 36). Moreover, this practice is in harmony with the whole modern tendency to attack, in elementary-school subjects, the precise difficulty in learning. Recent investigations of the misspellings of pupils have shown that for most words there is no one error which is characteristic of a sufficiently large percentage of misspellings to warrant calling attention to it. Relatively few words have a type of error which includes as much as 50 per cent. of the misspellings of pupils attempting those words. For most words, the percentage of the most frequent type of error to the total misspellings is very small. For example: 200 pupils in each of three grades attempted certain words and with the following results:

(Word to be spelled: *publication*)

	Grade IV	Grade VI	Grade VIII
No. of attempts	200	200	200
No. of errors	137	57	21
No. of different errors	126	48	19
Most frequent error			
<i>Puplication</i>	(4)	(5)	(2)

(Word to be spelled: *brought*)

	Grade IV	Grade VI	Grade VIII
No. of attempts	200	200	200
No. of errors	45	14	5
No. of different errors	17	9	4
Most frequent errors			
<i>Brough</i>	(7)	(3)	(2)
<i>Brot</i>	(8)	(3)	(2)

The simple word *top* was missed by five pupils and in five different ways. Often one part of a word will contain several errors, but even when errors are summarized under the part of the word missed, the relative frequency with which a given part

of the word is missed does not, in the case of most words, warrant particular treatment (7).

Even in the case of words which show a type of misspelling, or a difficulty with a certain part of the word which would include as much as half of all misspellings, it has yet to be shown that any special treatment of the difficult part of the word, such as writing it in italics or in colors, increases the likelihood that the error will be eliminated. It does seem possible that the stress on pronunciation and syllabication previously recommended will give the necessary attention to each part.

Obviously, the economical application of such a method must be delayed until investigations now under way have shown just which words have typical errors, and what the errors are.

33. Saying the letters does not add to efficiency.

This method is reported by most investigators as giving inferior results, and this inferiority is further hinted at by the fact that it has often been found to be the method by which poor spellers learn (1, 23, 40, 95, 97). This does not mean that pupils can not learn to spell in oral spelling lessons. The data merely indicate that this method of learning is considerably less efficient than those recommended. Even as a test of spelling, writing is to be preferred, since writing duplicates the conditions the child confronts in life.

34. It is important to expend some time on drill in recalling the visual image of the word rather than to expend all the time in impressing this image.

Having pupils close their eyes facilitates drill in recall, and in addition, is of administrative value in enabling the teacher to see whether or not all pupils are participating. This visual recall may be re-enforced by writing the word. Each recall should be immediately checked by comparing it with the correct form (2, 38, 61, 78, 95, 118).

35. Writing a word is an aid in learning to spell it.

Writing the word in the air apparently does no harm and probably does no good, except as an administrative device for enabling the teacher to keep all pupils working. The weakness of air writing is to be found in the time required and the vagueness of the

writing movements. Furthermore, there is no resulting record to compare with the correct form (48, 125).

It is much better to write on paper with the blunt end of a pencil and still better actually to write the word. Actual writing has the advantage of greater definiteness of movement and of greater similarity to the actual habit we desire to form. In addition, it leaves a record to check with the correct form. Each practice attempt should be covered with a slip of paper to avoid on the succeeding trial, the tendency to copy any error made. In the lower grades the mechanical difficulty of writing makes it of doubtful value, so that for these grades some investigators stress auditory and visual methods (23, 29, 98, 102).

36. The amount of repetition necessary for fixing a word varies greatly with individuals.

Nonsense syllables and actual spellings are forgotten very rapidly unless the learning has been thorough (38, 61, 95, 112, 118). To pass arbitrary judgment, it is probably advisable to learn each word to the point where it can be correctly written on three consecutive trials with each trial covered before the next one is made.

37. The efficiency of drill in a given spelling period is increased by distributing the drill on a given word so that practice on other words intervenes (1, 39).

38. There should be provision for review drill periods.

In other words, spelling, as other subjects, is more economically taught by distributing drill on a given item over a number of days (38, 68, 87, 89, 95, 112, 117). This would be anticipated from the nature of the curve of forgetting, and it is borne out by experimental teaching. Wallin advocated in the Cleveland plan a very elaborate scheme for occasional reviews at long intervals, aggregating five reviews in two years. There are no data to show just how these drills should be distributed, save that the length of period which should intervene between reviews depends somewhat upon the amount of over-learning in the preceding learning periods. Evidence concerning the rapid forgetting of words at the outset would indicate that the first review should occur within a day or two after that on which the words are taught. A recent experiment (95) in teaching 200 words in a month showed a medium abil-

ity of 100 per cent. on the first fifty words taught, when the words were learned at the outset to 100 per cent. correctness, and relearned to 100 per cent. efficiency on each of the last two days (the time limit was fifteen minutes a day, including study and testing).

The following distribution is recommended tentatively until more conclusive data are secured. (1) Learn to 100 per cent. at the outset (100 per cent. being the ability to spell the word correctly on three consecutive trials). The time necessary for this first learning will depend upon the number of words taught. (See statement on number of words to be taught per lesson). (2) Test on this list twice in the following month, and relearn to 100 per cent. all words missed. (3) Pupils who miss words at the end of this period should put these words in a special list as presenting special difficulty, and these words should receive regular review drill. (4) At the beginning of each year, test on words shown in the previous year to be difficult, and include words missed on this test as part of regular lessons for that year.

39. An aggressive interest is of major importance to economy in learning to spell.

The evidence for the statement is indirect and observational, being drawn from experiments in other fields, from general psychology, from the study of class teaching, and from interpretations of results of experiments in other phases of learning to spell (61, 95, 117, 118). Few of the factors discussed above are so influential as this one. It is not unlikely that a pupil will learn more readily with an inferior method coupled with vigorous interest, than with a superior method, applied in a sluggish or indifferent manner. Fortunately, there is every reason to believe that an efficient method can be made just as interesting as an inefficient one.

40. It is important that each pupil be taught how to learn to spell.

The superiority of class as compared to independent study (as shown in the investigations cited in Rule 11), has been due in part to the fact that pupils when left to themselves are likely to use methods of study less economical than those directed by the teacher. Ordinarily, the graduate of our elementary school has not been taught any method of learning to spell. Each year, the first les-

sons in spelling should be given over to insuring proper methods of learning. It has been found useful to place in the hands of pupils of Grades IV to IX, printed directions for learning. The teacher need not hesitate to give pupils such a method on account of individual differences in image types. Most people use readily two or more types of imagery, shifting unconsciously from one to the other, often for no discoverable reason (4, 36, 84). Kline, although reporting that students learn to spell more efficiently when learning by methods favorable to their image types, shows that even when the learner used methods which were designed to be directly opposed to his image type, the difference was slight (59). These data are substantiated by the fact that there seems to be practically no correlation between imagery and spelling ability (24). Other investigations have not shown that normal individuals differ so widely as has been supposed in the methods by which they can learn to spell most economically (1, 45, 47, 84, 85, 86, 122, 123, 124, 125).

Perhaps the small significance of type of imagery is to be explained by the fact that children, and adults as well, readily substitute, unconsciously, their own preferred type of imagery when the presentation involves another type of imagery (1).

Differences such as may exist in imagery could not be discovered by the ordinary teacher. As a matter of fact, the discovery of the precise image type of an individual constitutes a very difficult and elusive problem, even for the psychologist (4, 28, 52, 54). Accordingly, we may recommend one method for all, with the conviction that in practice it will get results which are, on the average, superior to what the pupil would get if he should work out a method for himself, or to what would be gotten should the teacher work out a method for him. The following set of rules is designed to embody the conclusions of various experiments in economy of learning, and is in a form to be used by the pupil. A set of directions of this sort has been used for the past term by the pupils in the University Elementary School at the State University of Iowa.

HOW TO LEARN TO SPELL A WORD

1. The first step in learning to spell a word is to pronounce it correctly. If you do not know how to pronounce a word, look up the pronunciation in the dictionary. When you are certain that you know how the word is pronounced, pronounce it, enunciating each syllable distinctly and looking closely at each syllable as you say it.

2. Close your eyes and try to recall how the word looks, syllable by syllable, as you pronounce it in a whisper. In pronouncing the word be sure to enunciate the syllables carefully.

3. Open your eyes to make sure that you were able to recall the correct spelling.

4. Look at the word again, enunciating the syllables distinctly.

5. Recall again, with closed eyes, how the word looked.

6. Check again with the correct form. This recall (as in 2 and 5) should be repeated at least three times, and oftener if you have difficulty in recalling the correct form of the word.

7. When you feel sure that you have learned the word, write it without looking at the book, and then check with the correct form.

8. Repeat this two or more times without looking either at the book or at your previous attempts.

9. If you miss the word on either of these trials, you should copy it in your spelling notebook, since it probably is especially difficult for you.

41. Proper testing is an important factor in improving spelling.

Most teachers are familiar with the use of Ayres' scale as a method of measuring spelling ability (11). Many teachers have also used the Buckingham scale (21) and the Starch test (105). The Ashbaugh-Iowa scale, which covers approximately the 3,000 words most commonly used in correspondence, will soon be issued (7). In addition to the measurements obtained by using scales of this sort, the teacher should test on each word taught as a spelling exercise. This, of course, is implied as a part of the recommendations given above, under the advice: Test all words before teaching. From the standpoint of stimulating corrective teaching, it is important to have a record not merely of the child's score by one or all of the above-mentioned scales, but in addition, a record of his attempts on each of the words supposed to be learned by him during the school year. With proper blanks such a record of repeated tests can be kept on a per word basis, with little more effort than is

ordinarily involved in correcting papers. Much of the work may be done by the pupils, since the pupils know that it is to their advantage (in preparation for future tests) to record for purposes of attack all errors which they make.

CONCLUSION

In conclusion, attention should be called again to the fact that the evidence as to the most economical method of teaching spelling is not complete. Nor are the various factors involved of equal importance, even if the reliability of present evidence be assumed. In the opinion of the writer there are five factors of major importance on which the evidence is clear. These five factors may be expressed as rules:

- (1.) Test all words before teaching.
- (2.) Let each child work only on the words difficult for him and provide him with a definite method of learning them.
- (3.) Provide for rigorous reviews.
- (4.) Show the pupil his progress daily, weekly, monthly and yearly.
- (5.) Keep up the interest.

BIBLIOGRAPHY

1. Abbott, Edwina E. *On the Analysis of the Memory Consciousness in Orthography*. Psych. Rev. Mon. Supp.; 11:127-158.
2. Abbott, Edwina E. *On the analysis of the factor of recall in the learning process*. Psych. Rev. Mon. Supp.; 11:159-177.
3. Anderson, W. N. *The Determination of a Spelling Vocabulary Based upon Written Correspondence*. (Ph. D. Thesis; University of Iowa, 1917.)
4. Angell, J. R. *Methods for the Determination of Mental Imagery*. Psych. Rev. Mon. Sup.; 53:1910, 61-107.
5. Arps, G. F. Attitude as a determinant in spelling efficiency in immediate and delayed recall. *Jour. Educ. Psych.*; 6:1915, 409-418.
6. Ashbaugh, E. J. *Variability in Spelling*. (Unpublished study, Univ. of Iowa, 1918.)
7. Ashbaugh, E. J. *A Spelling Scale for 3000 Common Words*. Univ. of Iowa Extension Bull. No. 43, 1918.
8. Ashbaugh, E. J. and Horn, E. *The Necessity of Teaching Derivations*. (Unpublished study, Univ. of Iowa, 1918.)
9. Ayres, L. P. *The Public Schools of Springfield, Ill.* (Russell Sage Foundation). 1914, pp. 71-74.
10. Ayres, L. P. *The Spelling Vocabulary of Personal and Business Letters*. (The Russell Sage Foundation, Number E 126).
11. Ayres, L. P. *A Measuring Scale for Ability in Spelling*. (Russell Sage Foundation) 1915.

12. Ballard, H. H. A modern Babel, *Ped. Sem.* 14:1907, 305-321.
13. Barnes, Earle. How Words Get Content, in his *Studies in Education*, 2:43-61.
14. Betts, G. H. *The Distribution and Function of Mental Imagery*, (Teachers College Contrib. to Educ. No. 26).
15. Bobbitt, F. *What the Schools Teach and Might Teach*. The Cleveland Survey. 1915.
16. Bolton, F. E. *Principles of Education*. New York, 1910.
17. Bawden, H. H. *A Study of Lapses*. *Psych. Rev. Mon. Sup.*; Vol. 3, No. 4, 1900.
18. Brandenburg, G. C. The spelling ability of university students. *Sch. and Soc.* 7:1918, 26-29.
19. Breed, F. S. *An Experimental Study of Print versus Script in the Teaching of Spelling*. (Unpublished study).
20. Brown, F. W. Learning to spell. *Educ.*; 34:1913-1914, 582-587.
21. Buckingham, B. R. *Spelling Ability—Its Measurement and Distribution*. (Teachers College Contributions No. 59).
22. Buckingham, B. R. *Teaching Elementary School Subjects*. (Rapeer, Editor). 1917, Ch. III.
23. Burnham, W. H. The Hygiene and Psychology of Spelling and Criticism. (Summary of results reported by various investigators including Lay, Schiller, Smedley, Fuchs and Haggenmuller). *Ped. Sem.*, 13:1906, 480-501.
24. Carey, N. Factors in the Mental Processes of School Children. *British Jour. Psych.*, 7:1914-15, 453-490.
25. Carmen, E. K. Cause of chronic bad spelling. *Jour. of Pedagogy*, 13: 1900, 86 ff.
26. Charters, W. W. A spelling "hospital" in the high school. *Sch. Rev.*, 18:1910, 192, 195.
27. Clark, J. S. Real simplified spelling. *The Nation*, 83:1906, 390-91.
28. Colvin, S. S., and Meyers, E. J. *The Development of the Imagination of School Children*. *Psych. Rev. Mon. Sup.*, 11:1909, 85-125.
29. Colvin, S. S. *The Learning Process*. Pp. 168 ff.
30. Cook, W. A. Shall we teach spelling by rule? *Jour. Ed. Psych.*, 3:1912, 316-25.
31. Cook, W. A. and O'Shea, M. V. *The Child and His Spelling*. Indianapolis.
32. Cornman, O. P. *Spelling in the Elementary Schools*. 1902.
33. *Cyclopedia of Education*. Article by Branden Mathews on *Spelling and Spelling Reform*.
34. Des Moines Public Schools, Annual Report for 1915.
35. DeBusk, B. W. The vital index in development. *Ped. Sem.* 24:1-18.
36. Douse, T. LeMarchant. A study of misspelling and related mistakes, *Mind*, 9:1900, 85-93.
37. Earle, E. L. *The Inheritance of the Ability to Learn to Spell*, Columbia Univ. Contributions to Philos., Psych., and Education. No. 2, 1903.
38. Ebbinghaus, Hermann. *Memory*. Eng. Tr. New York.
39. Eisenberg, J. L. *Experimental Studies in Spelling*. (Doctorate Thesis; University of Pa., 1913.)
40. Fairhurst, S. S. An analysis of the mental processes involved in spelling. *Report British Assoc. Advancement Science*. 83:1913, 302-4, 687.
41. Foster, F. M. The results of a recent spelling test at the University of Iowa. *Sch. and Soc.*, 5:1917, 506-8.
42. Foster, W. T. The spelling of college students. *Jour. Educ. Psych.*, 2: 1911, 211-215.
43. Fernald, M. R. *The Diagnosis of Mental Imagery*. *Psych. Rev. Mon. Sup.*, 14:Whole No. 58, 1912-13.

44. Fulton, Martha J. An experiment in teaching spelling. *Ped. Sem.*, 21:1914, 287-289.
45. Gill, E. J. The teaching of spelling. *Jour. Exp. Ped.*, 1:310 ff.
46. Green, Mabel. Preliminary experiments in the teaching of spelling. *Midland Schools*, 31:Nov., 1916, 73-75.
47. Greene, H. A. and Horn, E. *Visual Presentation of Syllables in Learning to Spell*. (Unpublished Study, State University of Iowa, 1918.)
48. Greene, H. A. and Horn, E. *Teaching Spelling*. (Unpublished Study, State University of Iowa, 1918.)
49. Gregory, B. C. The rationale of spelling. *Elem. Sch. Teacher*, 8:1907, 40-55.
50. Grupe, Mary. Review of pedagogical studies in the teaching of spelling. *Education*, 34:1913, 1-19.
51. Hall, G. S. *Educational Problems*. New York, 1911. Vol. II, 427-436.
52. Hawkins, C. J. Experiments on memory types. *Psych. Rev.*, 4:1897, 289-294.
53. Heilman, J. *Effect of Syllabication on Learning to Spell*. (Unpublished study, Colorado State Teachers College.)
54. Henmon, V. A. C. Relation between mode of presentation and retention. *Psych. Rev.*, 19:1912, 79-96.
55. Hollingworth, L. S. *Psychology of Special Disabilities in Spelling*. (Columbia University Studies No. 88.)
56. Holmes, H. W. Time distribution by subjects and grades in representative cities. *Fourteenth Yearbook of this Society*. Part I: pp. 21-28.
57. Homan, T. B. *Correlations of Abilities in Immediate and Deferred Memory*. (Master's Thesis; 1916. State University of Iowa.)
58. Horn, E. and Prosser, M. *The Relation of General Ability to Progress in Spelling*. (Unpublished)
59. Horn, E. *A Study of the Vocabulary of Letters written by Bankers to Bankers about Banking*. (Unpublished)
60. Horn, E. *A Compilation of the Commonest Words from Eight Investigations of Spelling Vocabulary*. (Unpublished)
61. Horn, E. and McBroom, M. *Individual Instruction in Spelling*. (Unpublished study, University of Iowa, 1918.)
62. Houser, J. D. An investigation of the writing vocabularies of representatives of an economic class. *Elem. Sch. Jour.*, 17:1916-1917, 708-718.
63. Houser, J. D. The relation of spelling ability to general intelligence and to meaning vocabulary. *Elem. Sch. Jour.*, 16:Dec., 1915, 190-199.
64. Howell, Annette; Hobson, Lucile; Washburn, M. F. Accuracy of visual memory and speed of verbal perception in poor spellers. *Amer. Jour. Psych.*, 28:1917, 157-159.
65. Johnstown, Pa., Public Schools, *The Teaching of Spelling*, 1913.
66. Jones, W. F. *Concrete Investigation of the Materials of English Spelling*. (University of South Dakota, 1913.)
67. Kallom, A. W. Some causes of misspellings. *Jour. Educ. Psych.*, 8: 1917, 398-402.
68. Kirby, T. J. *Practice in the Case of School Children*. (Teachers College, Columbia Univ. Contrib. No. 58, 1913.)
69. Kline, L. W. A study in the psychology of spelling. *Jour. of Educ. Psych.*, 3:381-400.
70. Kratz, H. E. *Studies and Observations in the Schoolroom*. Boston, 1907.
71. Lauterbach, Paul. *The Status of Spelling in Eighty Cities*. (Unpublished study, University of Iowa.)
72. Lester, J. A. Teaching freshmen to spell. *English Jour.*, 5:404-410.

73. Lester, J. A. *A Spelling Review*. (Hill School, Pottstown, Pa.)
74. Lull, H. G. A plan for developing a spelling conscience. *Elem. Sch. Jour.*, 17:January, 1917, 355-361.
75. McFarland, W. H. Relation between spelling judgment and spelling ability. *Midland Schools*, 31:Sept., 1916, 19-21.
76. Mead, A. R. Transfer of spelling ability. *Jour. Educ. Psych.*, 8:1917, 41.
77. Mead, C. D. and Becker, T. Spelling by visualization versus drill methods. *Jour. Educ. Psych.*, 5:1914, 29-31.
78. Meumann, E. *The Psychology of Learning*. 1913, P. 181.
79. Meumann, E. *Schul und Haus Arbeit*. (Summary in *Educational Problems*, Part 2; by B. Stanley Hall.)
80. New Orleans Public Schools. Spelling List, 1916.
81. Nicholson, Anne (Editor). *A Speller for the Use of the Teachers of California*. Sacramento, Cal., 1914.
82. Nifenecker, E. A. *Measurement in Spelling*. (Department of Education, City of New York. Division of Reference and Research.) Publication No. 16, 1918.
83. Norrworthy, Naomi. *The Psychology of Mentally Deficient Children*. (Doctorate Thesis, 1906. Columbia University.)
84. Paull, Mabel A. *Individual Differences in Oral and Visual Learning*. (Master's Thesis, 1918. State University of Iowa.)
85. Pearson, H. C. The scientific study of the teaching of spelling. *Jour. Educ. Psych.*, 2:1911, 241-252.
86. Pearson, H. C. Class vs. individual learning. Experimental studies in the teaching of spelling. *Teachers College Record*, Jan., 1912.
87. Perkins, Nellie L. The Value of Distributed Repetitions in Rote Learning. *Brit. Jour. Psych.*, 7:1914-1915, 253-261.
88. Prentice, M. H. Teaching spelling by use. *Atlantic Educ. Jour.*, 11: 1915-16, 351-4.
89. Pyle, W. H. Economy in learning. *Jour. Educ. Psych.*, 4:1913, 148-158.
90. Pryor, H. C. Spelling. *Fourteenth Yearbook of this Society*, 1915, Pt. I, pp. 78-89.
91. Pryor, H. C. A suggested minimal spelling list. *Sixteenth Yearbook of this Society*, 1917, Pt. I, pp. 73-84.
92. Pryor, H. C. *A Study in the Psychology and Pedagogy of Spelling*. (Master's Thesis, University of Colorado, 1912.)
93. Rice, J. M. The futility of the spelling grind. *Forum*, 23:1897, 163-172.
94. Riley, J. W. *The Springfield Tests*. Springfield, Mass. 1906.
95. Ritter, E. E. and Horn, E. *An Experiment in Individual Instruction in Spelling*. (Unpublished study, University of Iowa. 1918.)
96. Rowland, V. H. The function of rules in spelling. *Wyoming Sch. Jour.*, 12:May-June, 1917.
97. Rusk, R. R. *Introduction to Experimental Education*. New York, 1912, pp. 267-276.
98. Sandiford, P. *The Mental and Physical Life of School Children*. New York, 1913, pp. 332-337.
99. Schwierung, O. C. A study in grouping by similarity in spelling. *Wyoming Sch. Jour.*, 12:May-June, 1917.
100. Sears, J. B. *Spelling Efficiency in the Oakland, Cal., Schools*. (Bureau of Information, Statistics, and Educational Research. 1915.)
101. Sewell, J. W. Definition in the spelling recitation. *Elem. Sch. Teacher*, 10:367-375.
102. Smedley, F. W. *Child Study Report No. 3*. (Dept. of Child Study and Ped. Investigation. 1902.)
103. Smith, H. W. *A Comparison of the Physical Development of Grammar School Children with their School Standing*. (Master's Thesis. State University of Iowa. 1911.)

104. Starch, D. Measurement of efficiency in spelling. *Jour. Educ. Psych.*, March, 1915, 167-186.
105. Starch, D. *Educational Measurements*. 1916, Ch. VI.
106. Stead, H. G. Spelling errors in children. *Experimental Pedagogy*; 2: 1913-1914. 362-364.
107. Suddards, Ida. An investigation into spelling at the Fielden Demonstration School. *Report Brit. Assoc. Advancement Science*, 83:1913, 304-305.
108. Suzzallo, H. *The Teaching of Spelling*. Chicago, 1913.
109. Theisen, W. W. *Studies in Educational Measurements in Wisconsin*. No. 1, pp. 18-20. 1918.
110. Thorndike, E. L. *Educational Psychology*. (Vol. III, Ch. XVI.)
111. Thorndike, E. L. *Measurements of Twins*. (Archives of Philosophy, Psych. and Scientific Methods. No. 1. 1905.)
112. Thorndike, E. L. *Educational Psychology*. Vol. II.
113. Turner, E. A. Rules versus drill. *Jour. Educ. Psych.*, 3:1912, 460-461.
114. Tidymann, W. F. Critical study of Rice's investigation of spelling efficiency. *Ped. Sem.*, 22:Sept., 1915, 391-400.
115. Wagner, C. A. An experimental study. *Grouping by Similarity as a Factor in the Teaching of Spelling*. (Doctorate Thesis, University of Pa.)
116. Wallin, J. E. W. Has the drill become obsolescent? *Jour. Educ. Psych.*, 1:200-213.
117. Wallin, J. E. W. *Spelling Efficiency in Relation to Age, Grade and Sex, and the Question of Transfer*. Baltimore, 1911.
118. Watt, H. J. *The Economy and Training of Memory*. New York, 1909.
119. Whipple, G. M. *Manual of Mental and Physical Tests*. Part 2, pp. 150-204. Baltimore, 1915.
120. Whipple, G. M. The spelling of university students. *Jour. Educ. Psych.*, 1:1910, 31-3.
121. Wilcox, M. J. *The Use of a Rule in Teaching Spelling*. (Master's Thesis, 1917. State University of Iowa.)
122. Winch, W. H. Experimental researches on learning to spell. *Jour. Educ. Psych.*, 4:1913, 524-37; 579-592.
123. Winch, W. H. Further experimental researches on learning to spell. *Jour. Educ. Psych.*, 5:1914, 449-460.
124. Winch, W. H. Additional researches on learning to spell. *Jour. Educ. Psych.*, 7:1916, 93-110.
125. Winch, W. H. A motor factor in perception and memory. *Jour. Exp. Ped.*, June, 1912.
126. Witmer, L. A case of chronic bad spelling. *Psych. Clinic*, 1:1907, 53-64.
127. Whitehead, L. G. A study of visual and aural memory processes. *Psych. Rev.*, 3:258-269.
128. Wolfe, Hattie A. *An Experimental Study of the Effect of Syllabication in Spelling*. (Master's Thesis, University of Chicago, 1918.)
129. Woody, C. *The Constancy of Spelling Achievement*. (University of Washington, 1918. Unpublished study.)
130. Wyatt, S. The Correction of Errors. *Spelling Jour. Exp. Ped.*, 2:1913-1914, 122-127.
131. Wyckoff, Adelaide E. Constitutional bad spellers. *Ped. Sem.*, 2:1892, 448-451.
132. Yoakum, G. A. An experiment with "The One Hundred Spelling Demons of the English Language." *Midland Schools*, 29:205-208.
133. Zook, S. A. *An Experimental Study in the Teaching of Spelling*. (Master's Thesis. University of Chicago, 1917.)

CHAPTER IV

PRINCIPLES OF METHOD IN TEACHING ARITHMETIC, AS DERIVED FROM SCIENTIFIC INVESTIGATION

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INTRODUCTORY

The first step in economy of time in learning is the determination of precisely what associations, what bonds, should be formed. After the minimal essentials of results have been satisfactorily determined, there remains the problem of discovering the best methods and devices of instruction for obtaining these results. For arithmetic the first problem has been dealt with in the three previous reports of the Committee on Economy of Time, and although it is not yet possible to make a final statement of the particular bonds which should be formed, there is sufficient unanimity of agreement on a number of items to warrant a compilation of the scientific information concerning economical methods of teaching. It is not wise to wait until the solution of the first problem is completed before attacking the second, even though the solution of the first is in theory a prerequisite for the second. The best results will be obtained by carrying on the two lines of work simultaneously.

Below are stated a number of principles, or rules; some of them are indicated by the experimental evidence that is now available; others are deduced from general psychological or educational principles. Following the statement of the rule, the evidence upon which it is based is described briefly. As is indicated in several instances, the available evidence is not conclusive, but it is thought best in this report not to emphasize these limitations. The numbers in parentheses refer to the bibliography at the end of the chapter.

THE RULES

1. *In teaching the number concept, which is fundamental in arithmetic, purposeful experience with concrete objects should be provided. Counting and measuring are two of the most fruitful forms of experience.*

The evidence for this principle, while somewhat indirect, is abundant. It is found in the origins of our number system, and in the observed behavior of children.

Two comments are needed. In the first place, the experience must be purposeful, *i. e.*, must be in response to a need or purpose which the child conceives as real. The mere counting of splints or measuring of objects in imitation of the teacher and without a purpose may have, and most frequently does have, no meaning for the child. In such cases no progress is made toward the engendering of the number concept. The other point to be remembered is that many children have had much experience of this sort before they come to school. It is then a waste of time to require them to duplicate it in school.

2. *In general, the meaning should be taught before the word or other symbol is given to the child. This applies to the number symbols 1, 2, 3, 4, etc., and to the technical words of arithmetic such as, 'add,' 'subtract,' 'foot,' 'yard,' 'pound,' 'gain,' 'how much,' and the like.*

This rule is deduced from general principles. Where the meaning is difficult to give or is beyond the comprehension of the child, authorities generally agree that the symbol or process may be given and the child may be expected to acquire some degree of meaning from its use.

3. *Learning the tables is a matter of memorizing and the rules for memorizing apply.*

For arithmetic these rules may be stated as follows, unless otherwise stated they are deduced from the general rules for memorizing.

(a) *The child should understand the meaning of the combinations which he is memorizing.*

Experimental evidence clearly shows that logical, or meaningful, material is memorized more quickly and with less effort than,

material which has no meaning. In order that the child may understand what he is memorizing, numerous authorities have urged that he be required to develop the combinations. However, it is not the meaning of a particular combination, such as 4 times 7 is 28, that is important here, but the meaning of the operation of multiplication. The child may be asked to develop a few of the combinations in order to get this meaning of the operation, but after he has this idea, time is saved by his being told the combinations, either by the textbook or by the teacher.

(b) *Attentive repetitions are necessary to fix the associations in learning the tables. These repetitions may be given either in isolated drill or in the use of these number facts in the doing of examples.*

Mere repetition is not sufficient. It must be attentive. This rule applies to any memorizing which occurs in arithmetic. It follows from the general laws of learning.

(c) *For permanent memorizing (which is desired in this case) the repetitions of drill must be carried beyond the point where immediate recall is just barely possible.*

(d) *The learning should be done under some pressure or concentration.*

(e) *Memorize the number facts in groups, not one fact at a time.*

The last two rules make it advisable to concentrate upon a group of tables, such as the multiplication tables, and learn them in large units and in a reasonably short period of time. For example, it is unwise to distribute the learning of the multiplication tables over several months or, as some courses of study would have it done, over two or three years.

4. *In learning the tables, the different combinations are not equally difficult and the number of repetitions of the several combinations should correspond to the degree of difficulty, the most difficult receiving the largest number of repetitions.*

This requires that the teacher supplement the provisions for repetition of the number facts that are found in our best number primers, because in them the easiest combinations occur most frequently.

Investigators (7, 11, 12, 18, 19) who have studied the relative difficulty of the several combinations, agree that they are not equal in difficulty. In addition, the results of the studies which have been made are well summarized by two conclusions stated by Browne (7) and one by Heilman and Shultis (18).

“The ease of combining is directly proportional to the difference between the two digits combined.

“The most difficult digits to combine, where no common factor is present, are those falling between the two extremes, where the difference is neither very large relatively nor very small. These are 7 plus 5, 7 plus 4, 8 plus 5, 8 plus 3, 9 plus 5, and so forth.”

“Second in point of ease are combinations which have one very low number such as 1 or 2. (Heilman and Shultis state that additions of equal numbers, such as 6 plus 6, are easiest. This agrees with Browne’s first statement.)”

In the light of the results of these studies the provision made by primary number books for drill upon the different combinations is significant. Holloway (19) tabulated the frequency with which the addition combinations occurred in “three of the best primers.” The highest frequency of occurrence is 378, for 3 to 2, which appears to have about median rank in difficulty. The five lowest frequencies are 34, for 9 plus 9; 45, for 8 plus 7; 47, for 7 plus 7; 50, for 8 plus 5; and 61, for 6 plus 6. Curtis, Holloway, and Heilman and Shultis agree that all of these combinations are more difficult than 5 plus 5, 4 plus 4, 3 plus 3, 2 plus 2, which occur 133, 110, 149, and 183 times, respectively. There is, then, no direct correlation between the number of times a combination occurs in our “best” number primers and the difficulty of the combination. That is, the provision for drill is not in accord with the need for it; so the teacher must make the adjustment needed.

The need for making appropriate provision for teaching each combination is pointed out by Counts (11, p. 55), who found the frequency of error for certain combinations was not the same for different groups of pupils. He says: “This would indicate that certain rather freakish associations are established in different groups through peculiar methods of instruction or some other experience common to the individuals making up each group.”

The tables of the other operations have not been studied as completely as have the addition tables, but the same kind of situation is indicated. The several combinations appear not to be equally difficult, although the order of difficulty probably is not the same for all operations. Also a study of our "best" number primers would doubtless show a corresponding failure of the frequency of occurrence of the combinations to agree with the need for practice upon them.

5. *The actual degree of difficulty of a combination to any one child is an "individual peculiarity." This condition makes it necessary to supplement class drills by provisions for individual practice.*

This statement is made by Courtis (12). Data secured by Counts (11) in the school surveys of Cleveland and of Grand Rapids tend to corroborate it. It also is in agreement with our general knowledge of individual differences.

6. *In addition and multiplication both forms of each combination should be taught.*

Experimental evidence shows that for the child 3 plus 9 is not the same as 9 plus 3. Thus, to insure that the child will know both forms of a combination in addition and multiplication, he must be taught both (12, 18, 19).

7. *In column addition, grouping digits to make 10 or some other convenient number is not helpful. A variety of procedure is to be expected, and the best results are obtained when pupils are urged to work rapidly but are allowed to choose their own methods.*

In adding columns of digits it is frequently possible to effect a grouping of digits whose sum is 10, 20, or some other number which is particularly convenient to handle. Beers (5), using five classes of high-school pupils, found that the introduction of grouping in column addition "decreased the accuracy" of the work as compared with the addition by single digits. His experiment extended over five weeks. A study extending over a longer period or one dealing with pupils in the fourth or fifth grades might yield a different result, but on the other hand the question might be raised whether a large expenditure of time for drill would be justified by the demand for a higher rate of column addition than can be attained by addition of single digits.

Arnet (3), using adult subjects, found that those who were most accurate in their adding did not make combinations. He states that the most striking feature of the adding, which was done orally, was the variety of procedure. It appears that adults use many devices or 'tricks' which are individualistic traits.

Beers found that, in general, the best results (including both rate and accuracy) were obtained when the pupils were urged to add rapidly but were allowed to choose their own method. This conclusion was reached when working with high-school pupils and might not apply to younger pupils. However, our knowledge of individual differences would tend to corroborate, rather than contradict this conclusion.

8. *The Austrian, or additive, method of subtraction is not superior to the 'take-away' method.*

More or less empirical statements have been made in favor of the Austrian method by writers¹ on the teaching of arithmetic. In opposition to these opinions, two out of three investigations (7, 9, 23) show the 'take-away' method to be superior to the Austrian method.

The conclusion to be reached appears to be that as yet neither of these two methods of subtractions has been demonstrated to be distinctly superior to the other. The evidence appears to be slightly in favor of the 'take-away' method when we consider the character of the experiments, but probably there are pupils for whom the Austrian method will be the most effective means of learning subtraction. The teacher should bear in mind that neither method is a panacea for the difficulties involved in learning subtraction.²

¹Brown, J. C. and Coffman, L. D. *How to Teach Arithmetic*, p. 160; Smith, D. E. *The Teaching of Arithmetic*, p. 46; Suzzallo, Henry. *The Teaching of Primary Arithmetic*, p. 86; Young, J. W. A. *The Teaching of Mathematics*, p. 235.

²Mead and Sears (23), who conducted one of the investigations just referred to, make this significant comment: "The pupils of the additive class showed over and over again a confusion of the two processes, a skipping back into the habit of adding the lower figure to the top one. The 'take-away' class showed almost no confusion in this." This comment is supported in a striking way by the median score of the 'Austrian' group after they had spent ten minutes a day for four weeks on "addition drill pure and simple." Their median score decreased two units. During the same period the 'take-away' group, who were given the same addition drill, gained nearly three units.

9. In 'borrowing,' it is better to increase the subtrahend by one than to decrease the minuend.

This rule is based only upon Browne's study (7) in which he used four adult subjects. In view of the fact that adults were used, the conclusion may not apply to school children.

10. *The Austrian, or multiplicative, method of division is superior to the direct association method in the initial stages of learning.*

Mead and Sears (23) also studied multiplicative division in comparison with the traditional methods of division. Two third-grade groups of pupils were selected so as to be approximately equal in ability, as shown by a preliminary test in multiplication. The experiment extended over four months. The following conclusions are quoted.

"In the case of the division classes there seems to be a preference for the multiplicative method of teaching division. The reason probably lies in the nature of the two processes, multiplication and division. The child does not have the same tendency to confuse the two as is apparent in addition and subtraction. If he has used either at all outside of school, he has probably used one as much as the other. The very placing of the figures in the written forms suggests different processes. The forms $\begin{array}{r} + \\ 2 \end{array}$ and $\begin{array}{r} - \\ 2 \end{array}$ suggest little difference, while there can hardly be a confusion as to what to do when the child meets the situations $\begin{array}{r} \times 4 \\ 6 \end{array}$ and $5 \overline{)20}$. He knows in the latter situation that "five times twenty" is not familiar, and that the real question is: "five times what are twenty?" There is not the same possible confusion, then, in teaching division by the shortened multiplication process as there may be in teaching subtraction by addition."

Browne (7), who used adult subjects, has also studied the process of division. He concludes: "Division is a derived process based upon multiplication. Unlike subtraction, which still continues to be largely influenced by the point of view of addition, division tends to free itself from the point of view of multiplication and to develop a type of immediate association."

Both of these studies agree that in the learning process the best results are secured when division is based upon multiplication.

Mead and Sears did not extend their study beyond the initial stage, but Browne asserts that later division is performed by direct association. If this is the case, teachers should expect the Austrian method to disappear when the pupil is sufficiently advanced.

11. *The Austrian method of placing the decimal point in the division of decimals is more efficient than the traditional method.*

Drushel (14) has studied the relative merits of the two methods of placing the decimal points in division of decimals. The common rule in the older arithmetics is: "There are as many places in the quotient as those in the dividend exceed those in the divisor." The Austrian method is: "First render the divisor an integer by multiplying both the dividend and the divisor by 10 or some power of 10. Then proceed as with integral divisors." Upon the basis of data secured from 624 subjects (313 doing two examples and 311 doing one example), together with some facts secured from their school records, he concludes: "Regardless of what the texts say, it seems in the light of the investigation described above that the Austrian method should replace the old method in all teaching of division of decimals."

This study is based upon tests given to college freshmen who had had no arithmetic in their high-school course and the conclusions are based only upon the accuracy of the work. The rate of work was not considered. These facts, together with the peculiar nature of the test, suggests that the findings need corroboration.

12. *Most errors belong to recurring types. The most frequent of these types should receive special emphasis so that they can be eliminated.*

The recurrence of certain types of errors has been shown in a number of investigations based upon a careful analysis of test papers.¹ For example, Counts (11) found in a study of tests of addition of fractions given to the eighth-grade pupils that 60 per cent. of the errors were due to adding the numerators for a new denominator and also adding the denominators for a new denominator, as $\frac{3}{5} + \frac{1}{5} = \frac{4}{10}$. Twenty-seven per cent. of the errors

¹For a more complete statement of the errors which have been found to occur most frequently and suggestions for correcting them, see the writer's text: *Measuring the Results of Teaching*, Houghton, Mifflin Company.

were due to multiplying the numerators for a numerator and multiplying the denominators for a new denominator; as $3/5 \times 1/5 = 3/25$. In a test where it was necessary to reduce the sum to the lowest terms and a mixed number Kallom (1) found that 19 per cent. failed to reduce the result to a mixed number and 18 per cent. failed to reduce it to its lowest terms. About half failed to make either reduction. About one pupil in twenty failed to express the result correctly when reducing a fraction to its lowest terms, writing $20/15 = 1\ 5/15 = 1/3$ instead of $1\ 5/15 = 1\ 1/3$.

13. *Pupils should be taught to use an abbreviated phraseology.*

Some pupils are taught to call the digit to be added, or subtracted, or multiplied, or divided as well as the result of the operation. For example, in multiplying 857 by 6, such a pupil would say (or think): "6 times 7 is 42; write the 2 and carry the 4; 6 times 5 is 30 and 4 is 34; write the 4 and carry the 3; 6 times 8 is 48 and 3 is 51; write 51." This may be abbreviated thus: "42, write 2; 30, 34; write 4; 48, 51, write 51."

Conard and Arps (10) divided 64 high-school pupils in two equal groups. An equal amount of practice (8 periods) was given each group. One group was taught to use 'economical' methods *i. e.*, to use an abbreviated phraseology. The other used the 'traditional' methods. Courtis' Standard Research Tests, Series B, were given at the end of the experiment. The 'economical' group was superior in rate of work, accuracy and had a smaller variability. The greatest improvement was in division. The detailed data which are reported suggested that many of the very low scores are due to the use of 'traditional' methods.

14. *After the initial stage of practice, drill upon the fundamental combinations should be given by means of examples.*

After the tables have been taught so that the pupils can just give the combinations, drill must be given to fix the associations so that the combinations can be made rapidly and accurately. Two types of drill are possible: (1) drill upon the combinations as they occur in the tables, either in the regular order or in a mixed order; (2) drill upon the combinations as they occur in examples. The second method means that the pupils would get the drill upon the combinations by doing examples.

Courtis (12) has studied the relation between "knowledge of the tables," as shown by Tests 1 to 4 of Series A, and ability to work abstract examples, as presented in Test No. 7, Series A. He concludes: "It is true that, in general, if the tables of combinations are not well learned, good work can not be done, but it is not true that continued study of tables by a class as a whole or continued practice in figuring will produce continued growth.... Knowledge of the combinations makes for speed and accuracy (in Test No. 7) up to a certain point, but beyond this point other factors play such an important part that a greater knowledge of the tables is in itself no benefit.... With such individual differences it must be clear that knowledge of the tables is not in itself any guarantee of ability to work examples."

Mead and Sears present data which lead to the same conclusion. It is implied also by both Browne (7) and Arnett (3), and in our present concept of the transfer of training.

15. The period of practice should be from 10 to 15 minutes.

Although the optimal length of practice period has been studied by a number of investigators (5, 16, 20, 26), results are not very definite. The most elaborate study is by Kirby (20) whose conclusion was in favor of a short period (2 1/7 minutes) although he admits that such a short period has a practical disadvantage. Taking all the available data into consideration, the best length of period appears to be from 10 to 15 minutes. It is significant that two of the investigators, Kirby and Beers (3) state that other factors which contribute to improvement are more important.

16. Children's knowledge of their previous performances, combined with the desire to surpass those records, is the greatest factor contributing to improvement.

In accounting for the greater improvement by those pupils who were given the shorter practice periods, Kirby (20) brings out this principle. It is in agreement too, with the work of Bryan and Harter and of other students of the learning process. Thorndike (29) reached a similar conclusion when working with adults.

In Bloomington, Indiana, after the Courtis Standard Research Tests, Series B, had been given in February, 1915, in an experiment which Miss Kerr (17) reports, drill in addition was given five minutes a day for six weeks. "Each

pupil was given his scores in all of the fundamental operations and under his teacher's direction compared his individual scores with those of his section, his grade and the Courtis Standard for his grade. All this was done to reveal to him his own condition and to get him into the proper attitude to help himself." The drill was further motivated by weekly contests in addition for those who attained certain standards of accuracy.

Series B was given again at the close of the six weeks' drill. In addition the average gain in number of examples attempted, or rate of work, was 1.4; in accuracy 14 per cent. In the other three operations there was practically no gain. These gains become very significant when we find that Courtis (13) gives the following general medians: fourth grade, rate 7.4, accuracy 64; eighth grade, rate 11.6, accuracy 76. The gain from the fourth grade to the eighth grade is: rate 4.2; accuracy 12. Thus six weeks' drill given as indicated above produces a gain equivalent to one third of the total gain in four years in rate of work and a greater gain in accuracy. While this unusual gain may be due in part to the fact that some of the first scores were relatively low, this plan of drill is undoubtedly shown to be very effective.

A significant feature of the results is that the increased median scores were accompanied by a decreased variability. This is just the opposite of what usually occurs when class drills are given. However, we might reasonably expect that keeping the pupil informed of his standing would tend to do this.

17. A preliminary practice of five minutes at the beginning of the recitation serves as a "mental tonic."

Brown (6) studied the effect of five minutes of drill upon the fundamental operations given at the beginning of the class period. Stone's tests in the fundamentals and in reasoning were given to the sixth-grade pupils in three public schools and one private school. In each school the pupils were divided into two sections of equal ability as shown by these tests. One section was given five minutes' drill upon the fundamentals at the beginning of the class period. The teachers of the non-drill sections gave no drill during the period covered by this study. At the end of the experiment, tests similar to Stone's were given. The drill sections had covered the same subject matter in the textbooks as the non-drill sections. The drill sections made a much greater improvement in both rate of work and accuracy than did the non-drill sections. Moreover, the teachers of the drill sections reported that five minutes of preliminary drill acted as a tonic.

Phillips (25) repeated this experiment, using 10-minute drill periods with 69 pupils in Grades VI, VII, and VIII. With the exception of the sixth grade, his results agree with those of Brown.

18. In the operations of arithmetic, emphasis should be placed upon rapid work rather than upon accuracy.

The relation between speed and accuracy has been studied by a number of investigators. Thorndike (28) concluded that the individual who is most rapid in his work is most accurate. Also in most cases speed and accuracy increase together. The writer (24) studied two successive records of sixth-grade pupils when given the Courtis Standard Research Tests, Series B. The first test was given at the middle of the school year and the second in May. In each of the four operations the majority of the pupils showed a gain in both rate of work and accuracy.

Fukaya (15), using five adult subjects on a single-column addition, obtained data from which he concluded that "most attempts to secure speed are successful without loss of accuracy, but the attempt to secure accuracy is unsuccessful even though speed is sacrificed. The maximal amount of all-round efficiency in numerical computation is thus secured by emphasizing speed rather than accuracy." This conclusion agrees with the results which Wimmer (17) obtained with sixth-grade pupils.

The pedagogical application of this conclusion is obvious. The teacher should emphasize rapid work rather than accuracy. Of course, accuracy should not be neglected. Tell pupils to be accurate, but do not suggest that increased accuracy is to be secured by working more slowly. The greater emphasis should be placed upon the rate of work. There are doubtless exceptions, and there is a limit beyond which this general relation probably does not hold.

19. Pupils belonging to the same class have been shown to differ widely in achievement. This condition makes it necessary to provide for individual instruction.

The existence of individual differences has been demonstrated repeatedly. Their presence means that different pupils do not respond in the same way to the same instruction. Equal opportunity does not mean equal improvement. One pupil makes satisfactory progress under certain methods and devices while another pupil receiving the same instruction makes little or no progress. This condition requires some form of individual instruction which makes it possible to give each pupil the instruction which is fitted

to his needs. The Courtis Standard Practice Tests and the Studebaker Economy Practice Exercises are two devices for individualizing drill upon the fundamental operations with integers.

20. The Courtis Standard Practice Tests are superior to Thompson's Minimum Essentials.

Using 900 fifth-grade pupils, Mead (21) studied the relative effectiveness as practice material of the Courtis Standard Practice Tests and Thompson's Minimum Essentials in the four fundamentals. The 900 pupils were divided into two approximately equal groups. The Courtis Standard Research Tests, Series B, were given at the beginning and at the end of the experiment, which extended from February to May. With the exception of division, the results are slightly in favor of the Courtis Standard Practice Tests. In division the improvement of the two groups of pupils was approximately equal. In addition, the opinion of the teachers and principals was slightly in favor of the Courtis material. (See also Ref. 22.)

21. Arithmetical abilities are specific, and explicit training must be provided for each one.

Numerous studies have demonstrated that arithmetical abilities are specific, *i. e.*, that pupils may have, and frequently do have ability to do one type of example without possessing an equivalent degree of ability to do even a closely related type of example. For example, Beers (5) found that practice in adding columns of 10 digits did not materially affect the ability to add columns of 20 digits. This means that in order properly to equip pupils to do all types of examples, drill must be provided upon each type.

22. The development of the abilities of a pupil to do different types of examples is frequently not uniform. To meet this situation, diagnosis and corrective instruction is required.

This principle follows logically as a corollary of the preceding one, and it is also demonstrated by direct evidence. A number of individual cases taken from the school records in Boston (2) have been reported. They show not only that individual variations exist, but also that in many cases they have been materially reduced or entirely eliminated by diagnosis and corrective instruction. In an investigation based upon the Cleveland Survey Tests, Smith (27) reports the case of a pupil who exhibited marked irregularities

at the beginning, but who after a few weeks of corrective instruction showed almost uniform attainments.

23. *Arithmetical study and practice which is motivated by 'practical' problems produces results superior to those secured by using the problems in the textbook.*

This principle is based upon the results of four experiments carried on under the direction of Miss Grace A. Day of Teachers College, New York City.¹ Each of the experiments was conducted with only a small group of pupils, and the results of any one would not be significant, but all point to the same conclusion.

24. *Systematic measurement of the results of teaching by standardized tests produces a higher degree of efficiency.*

In Boston (4) the Courtis Standard Research Tests in Arithmetic have been used systematically in certain schools since 1912, whereas in others these tests were not given until 1915. In certain other schools, the use of the tests was begun between these two years. A comparison of the results obtained in the three groups of schools shows that the best results were obtained in those schools in which the tests had been used systematically since 1912. The value of the systematic use of the standardized tests is also indicated in Principle 16.

25. *Pupils need to be taught the meaning of technical terms that are used in the statement of problems, as a prerequisite for reasoning in solving problems.*

In an investigation covering a limited number of cases, Miss Chase (8) shows that pupils are strikingly ignorant of the technical terms that are used in stating the problems they are asked to solve. This being the case, 'reasoning' is impossible, because the pupil does not have the necessary data and must resort to memory and guess work. The remedy for this situation is specific instruction in the meaning of the technical terminology of the arithmetical problems.

TESTS AND SCALES FOR MEASUREMENT IN ARITHMETIC

A large number of tests have been devised to measure the results of teaching arithmetic. There is given here a selected list

¹The writer is indebted to Miss Day for making accessible these unpublished manuscripts.

of such tests, together with the address from which each may be obtained.

1. *Cleveland Survey Tests.* These were designed for use in the survey of the Cleveland Public Schools. They have been revised slightly and used in the surveys at Grand Rapids and St. Louis. The series consists of fifteen tests, including four in addition, two in subtraction, three in multiplication, four in division, and two in addition and subtraction of common fractions. The total working time is 22 minutes, and the administration of the tests is simple. They furnish a more detailed analysis than can be secured by means of the Courtis Standard Research Tests, Series B. Address Charles H. Judd, School of Education, University of Chicago, Chicago, Illinois.

2. *Courtis Standard Research Tests, Series B.* This series of tests consists of one test each of the four fundamental operations. The tests measure the rate and accuracy with which the pupil can perform these operations with one type of example. The administration is very simple. The total time required to give them is 26 minutes. They have been used extensively since their first publication in 1914. The measures have been proved reliable in 75 to 90 per cent. of the cases. Address Mr. S. A. Courtis, 82 Eliot Street, Detroit, Michigan.

3. *Monroe's Diagnostic Tests in Arithmetic.* This is a series of 21 tests, including operations with integers, common fractions and decimals. The tests are arranged so that the total time required for giving them is only 31 minutes. The diagnosis secured by their use is the most complete that can be secured by any series of tests now available. They are designed to supplement the Courtis Standard Research Tests, and are more helpful than those to the teacher. Tests 1 to 11 are on integers and may be used in Grades IV to VIII. Tests 12 to 16 are on common fractions and may be used in Grades V to VIII. Tests 17 to 21 are on decimal fractions and may be used in Grades VI to VIII. Address Bureau of Educational Measurements and Standards, Emporia, Kansas.

Woody's Arithmetic Scales. These consist of two series of four tests, one for each of the fundamental operations. They differ from such tests as the Courtis Standard Research Tests, Series B,

in that the examples in each scale have been carefully graded and arranged in order of difficulty. They are called "difficulty tests" to distinguish them from the type of test described above. In content they include integers, decimal fractions, common fractions and denominate numbers. Series A and Series B are similar, except that Series A is more finely divided. Address Bureau of Publications, Teachers College, Columbia University, New York City.

Starch's Arithmetical Scale. This test consists of a series of arithmetical problems which are arranged in order of increasing difficulty. Address Daniel Starch, University of Wisconsin, Madison, Wisconsin.

Stone's Reasoning Test. This is a single test designed to be given to Grades IV to VIII. The problems have been carefully evaluated. The test was used in the survey of the public schools of Butte, Montana, and Salt Lake City, Utah. Address Bureau of Publications, Columbia University, New York City.

Monroe's Standardized Reasoning Tests. These are a series of three tests—Test I for Grades IV and V; Test II for Grades VI and VII and Test III for Grade VIII. The problems of these tests have been carefully selected so as to be representative of the one-step and two-step problems in the arithmetic texts now in use. These tests supplement in a very valuable way the Courtis Standard Research Tests. Address Bureau of Cooperative Research, Indiana University, Bloomington, Indiana.

REFERENCES

1. Arithmetic: Determining the Achievements of Pupils in the Addition of Fractions. Bulletin No. 7 of the Department of Educational Investigation and Measurement. School Document No. 3, 1916. Boston Public Schools.
2. Arithmetic: The Value to the Teacher, to the Principal, and to the Superintendent of individual and class records from standard tests. Bulletin No. 8 of the Department of Educational Investigation and Measurement. School Document No. 22, 1917. Boston Public Schools.
3. Arnet, L. A. Counting and adding. *Amer. Jour. of Psych.*, 16:1905, 327.
4. Ballou, F. W. Improving instruction through educational measurement. *Educ. Adm. and Super.*, 2:June, 1916, 354.
5. Beers, George A. *Tests of Various Methods of Drill in Commercial Arithmetic.* (Master's Thesis, University of Chicago, 1913. Unpublished.)
6. Brown, J. C. An investigation of the value of drill work in the fundamental operations of arithmetic. *Jour. of Educ. Psych.*, 2:1911, 81-88 and 3:1912, 485-492, 561-570.

7. Browne, C. E. Psychology of the simple arithmetical processes. *Amer. Jour. of Psych.*, 17:1906.
8. Chase, S. E. Waste in arithmetic. *Teachers College Record*, 18: Sept., 1917, 369-370.
9. Clyde, J. B. *Data for Experiment on the Austrian and Take-Away Methods of Subtraction.* (An unpublished study made at the University of Iowa. Furnished by Professor Ernest Horn.)
10. Conard, H. E. and Arps, G. F. An experimental study of economical learning. *Amer. Jour. of Psych.*, 27:1916, 507-529.
11. Counts, George S. *Arithmetic Tests and Studies in the Psychology of Arithmetic.* Supplementary Educational Monographs. Vol. I, No. 4. University of Chicago Press.
12. Courtis, S. A. *Courtis Standard Tests in Arithmetic, Report of Measurements and Achievements and Standards of the New York City Public Schools.* Being pp. 389-546 in Final Report of the Educational Investigation Committee on the School Inquiry, City of New York, Vol. 1.
13. Courtis, S. A. *Third, Fourth, and Fifth Annual Accountings, 1913-1916,* (also capacity, ability, and performance in relation to standard scores and summary of tabulation.) Bulletin No. 4, Department of Cooperative Research. Detroit.
14. Drushel, J. Andrew. A study of the amount of arithmetic at the command of high-school graduates who have had no arithmetic in their high-school course. *Elem. Sch. Jour.*, 17:May, 1917, 657-661.
15. Fukuya, Shoan Masuzo. *An Experimental Study of Attention from the Standpoint of Mental Efficiency.* Psychology Monographs, Vol. 25, No. 4.
16. Hahn, H. H. and Thorndike, E. L. Some results of practice in addition under school conditions. *Jour. of Educ. Psych.*, 5:1914, 65-83.
17. Haggerty, Melvin E. (Editor). *Studies in Arithmetic.* Indiana University Studies. No. 32, Vol. 3, Sept., 1916.
18. Heilman, J. D. and Shultis, Frank W. *A Study in Addition.* Research Bulletin No. 1. State Teachers College of Colorado, Greeley, 1916.
19. Holloway, H. V. *An Experimental Study to Determine the Relative Difficulty of the Elementary Number Combinations in Addition and Multiplication.* State Gazette Publishing Co. Trenton, N. J., 1915. (Printed privately.)
20. Kirby, Thomas J. *Practice in the Case of School Children.* New York City, 1913, 98 p. (Teachers College, Columbia University. Contributions to Education, No. 58.)
21. Mead, Cyrus D. *An Experiment in the Fundamentals.* School Efficiency Monographs. World Book Co. 1917.
22. Mead, Cyrus D. and Johnson, Charles W. Testing practice materials in the fundamentals. *Jour. of Educ. Psych.*, 10:May, 1918, 287.
23. Mead, Cyrus D. and Sears, Isabel. Additive subtraction and multiplicative division tested. *Jour. of Educ. Psych.*, 7:May, 1916, 261-270.
24. Monroe, Walter S. *A Report of the Use of the Courtis Standard Research Tests in Arithmetic in Twenty-four Cities.* Kansas State Normal School, Emporia. Bulletin, new Ser., Vol. 4, No. 8.
25. Phillips, F. M. Value of daily drill in arithmetic. *Jour. of Educ. Psych.*, 4:1913, 159.
26. Pyle, W. H. Economical learning. *Jour. of Educ. Psych.*, 4:1913, 148-158.
27. Smith, James H. Individual variations in arithmetic. *Elem. Sch. Jour.*, 17:November, 1916, 195-200.

28. Thorndike, E. L. The relation between speed and accuracy in addition. *Jour. of Educ. Psych.*, 5:1914, 537.
29. Thorndike, E. L. Practice in the case of addition. *Amer. Jour. of Psych.*, 21:1910, 483.
30. Uhl, W. L. The use of standardized materials in arithmetic for diagnosing pupils' methods of work. *Elem. Sch. Jour.*, 18: November, 1917, 215-218.

CHAPTER V

PRESENT STATUS OF INSTRUCTION IN DRAWING WITH RESPECT TO SCIENTIFIC INVESTIGATION

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Scientific investigation of the materials and activities which are involved in learning to draw has not developed a body of information from which may be formulated a full set of rules to govern instruction in drawing. It cannot be claimed that the significant advances which have been made in the scientific study of the fundamental subjects of reading, writing, spelling and arithmetic have in any degree been paralleled in the field of drawing. No mention has been made of drawing in the excellent studies on economy of time and minimal essentials. A recent summary (27)* of publications presenting specific experimental or organized methods of art instruction included but six numbers, two of which were definitely experimental. The *Seventeenth Yearbook's* bibliography (5) of educational measurements gives to arithmetic 81 references, reading 69, handwriting 50, spelling 42 and drawing but 6.

It is possible, however, at the present time definitely to consider with profit the scientific aspects of drawing. Analytical scrutiny and experimental investigation, although in the initial stages of development in this field, already present a body of scientific evidence which bears materially upon the teaching process as it pertains to drawing and which seems worthy of deliberate consideration at this time. The pages which follow are primarily concerned with representative drawing as distinct from design and mechanical drawing. The following topics are presented in the order given: (1) the present complexity of drawing standards; (2) the appli-

*References in parentheses relate to the numbered list that concludes this chapter.

cation of the scientific method to drawing; (3) rules and principles applicable to drawing instruction which have been derived from scientific evidence; (4) bibliography.

I. THE PRESENT COMPLEXITY OF DRAWING STANDARDS

Progress in scientific experimentation in drawing has been greatly retarded by a general lack of agreement concerning its scope, aims, organization of courses, methods of teaching, standards of achievement, and means of measurement. The history of science shows that the establishment of its principles has depended upon fairly clear-cut delimitation of problems and co-operative effort in their solution. Art instruction has just emerged out of a long period of individualization which, while broadly experimental, has lacked both in design and collaborated activity. The most obvious need at present is a clear recognition of the common problems which now exist and the initiation of a united drive toward their solution. A preliminary glance at the present complex status of drawing in the public schools will make this clear.

Scope and aims. Drawing almost loses its identity as a distinct subject of instruction in the general programs of art and construction with which it is now intimately associated. The Salt Lake City Elementary School Art and Constructive Course is not exceptional in paralleling drawing and perspective in almost every grade with projects in construction and weaving, in modelling and pottery, in painting and coloring, in illustrating and composing, in design, in working drawings, in planning and pattern, in picture study, in aesthetics, and in historic ornaments. It is difficult to ascertain the present consensus of the aim of art and constructive work. Farnum states in his careful review (10) that "the broad and general purpose of culture through art education may be roughly divided into three distinct aims.....which are universally agreed upon. Such an education should train (a) in expression, (b) in observation, (c) in appreciation." These general aims have not been sufficiently analyzed to indicate avenues of scientific attack. It seems, therefore, more profitable at present to concern ourselves with the factors of drawing concerning which there is a larger consensus of opinion. The elements which enter into representative

drawing are well known and easily recognized. The terminology of drawing has been well standardized and the processes which enter into proportion, space relations, perspective, shading, etc., are sufficiently distinct and elemental to be considered analogous to the *fundamentals* in other subjects. Within this field quantitative standards may be set up and readily serve the cause of scientific inquiry.

Organization of courses and methods of instruction. The widest diversity exists in texts and courses of study in art and drawing as to topics, sequence, correlation, options, and requirements. No other subject in the curriculum receives greater variety of treatment. This has come about naturally through an attempt to follow the widespread aims of art and construction work. In contrast to this, the different methods of instruction for the various skills which constitute ability in representative drawing are definitely limited in number by the specific nature of representation. Experimentation among competing methods is therefore easily possible. The chief need here is for leaders to set the problems and provide methods of measurement adapted to the rank and file of teachers.

Standards of achievement. The widespread variety in the scope and organization of drawing instruction has prevented the development of uniform standards of achievement either for age or grade. There is no general agreement, for instance, as to whether or not a pupil in the fifth grade should be able to draw the human figure in varied positions. In case such ability is aimed at, there is no uniformity of opinion as to what degree of skill should be expected from, or how many there should be of, poor, average and good drawers. On the other hand, many individual instructors have had in mind, and numerous courses indicate, fairly definite achievements to be attained as a result of specified amounts of instruction. The objective nature of the products of drawing ability makes it quite possible to select samples of work which may indicate the degree of merit expected in a given grade or from a given amount of instruction.

A number of excellent beginnings have been made in this field. Sargent and Miller (25) have worked out a set of general standards of attainment in drawing for each of the first seven grades. Van

Oat has a similar set in preparation at the Iowa State Teachers College. These standards are based upon observation of the degree of skill which can be economically attained and which is sufficient to satisfy the pupils' needs in graphic expression. The standards given herewith are those set by Sargent and Miller for the fifth grade and indicate a specific advance over those which they set for the fourth grade. Whether or not these standards will meet public-school conditions is a problem which awaits further solution.

Standards of Attainment. Grade V. (Sargent and Miller)

I. Some training in systematic gathering of data, from textbooks, pictures, and objects for illustrating a given theme.

II. Ability

1. From memory, to draw and to model in the round with considerable detail, and to represent in different positions, and to sketch rapidly with expressive general effect, two or three selected birds and animals in addition to those learned in the previous grades. The use of objects, sketchbooks, and picture collections in gathering data for these.

2. To represent leaves and flowers in different positions. To study out effects of foreshortening by means of shadows, pictures, observation of nature, etc.

3. To sketch objects in good general proportion, and to sketch simple groups of two objects to show the relative proportions correctly. To represent some few objects in three dimensions.

4. To draw on paper, and at arm's length on the blackboard, right angles, squares, and oblongs, of specified proportions, on any given line—and also circles—and to bisect and trisect given lines free-hand.

5. To represent the human figure in any position with good proportions, and with more careful drawing of details than previously; that is, hands, head, and feet.

6. To represent most of the common types of landscape, either with water color, crayon, or on the blackboard with chalk.

III. Ability

1. To recognize and appreciate a good design, either the formal design or the decorative drawing, and to tell wherein it is good, and to make all drawings more or less decorative in character.

2. To conventionalize, by means of squared paper, mosaic, cross-stitch, weaving or otherwise, any familiar form for decorative use.

3. To make line borders, using several lines of varying widths, and to interlace these lines in turning corners, so that the effect will be pleasing and harmonious.

3. To print rapidly and well, using the single-lined letters, and to fit

several words into a given space, also to fit two or three letters into a given figure, and to make simple initial letters.

IV. The use of water colors and crayons with freedom and confidence.

1. Ability to match any given color with water colors or crayons and select readily those pigments which when mixed will produce the desired tone.
2. Some experience in the decorative uses of different relations of color values and hues. An understanding of the terms 'value' and 'hue.'
3. Ability to make flat washes, with special emphasis upon dark washes.

Means of measurement. A definite start has been made in the formation of standard tests to measure ability in drawing. Several scales have been constructed scientifically. The pioneer Thorndike scale (29) is composed of fourteen drawings which range in general merit by irregular but specifically measured steps from Quality 0 up to Quality 17. It is probable that drawing involves too many types of skill and variations in content to be adequately measured by a single general scale. It seems necessary, and certainly is more productive with our present knowledge of measuring scales, to limit the scope of drawing scales to a single object or aspect of drawing. This having been done, patient and conscientious labor are alone needed to produce a desirable number of useful standard scales.

Several useful scales of specific type have been constructed. H. O. Rugg (24) devised a scale for the measurement of free-hand lettering. It is composed of a series of eight samples of free-hand lettering placed in order of increasing merit. Specimens of free-hand lettering may be graded by direct comparison with the scale. The author has devised a rough scale (unpublished) for the measurement of drawings of chairs and similar specimens of furniture. It has proved useful for grading drawings of this character in connection with research work. Childs (6) measured the drawing ability of 2,177 children with a supplemented Thorndike scale. The Eastern Arts Association Committee on a Scale of Drawing (1) has made a number of interesting tests looking toward the establishment of uniform standards in representative drawing in the several grades of the elementary school. One result of the committee was the formation of a scale for measuring drawings of bowls, or similar objects, when seen below the eye level in the partic-

ular characteristic of *relative width of ellipses*. The distribution of the 2,856 children tested has also been charted by grades.

II. THE APPLICATION OF THE SCIENTIFIC METHOD TO DRAWING

Any treatment of scientific method will vary according to the particular phenomena to which it is applied, but for present purposes of analysis it may be considered to involve five phases of correlated activity, namely: (1) unbiased attitude, (2) analytical scrutiny, (3) quantitative records, (4) experimentation, and (5) judgment on the basis of observed results.

Unbiased attitude. Open-mindedness is universally esteemed as an attribute of successful study. Willingness to investigate, however, is a first essential which has not appealed to certain prominent students of art as being a necessary phase of the unbiased attitude. A number of replies have come in response to inquiries made in this study which indicate that the writers believe that nothing can be accomplished through the use of scientific method in the field of art. It is gratifying, therefore, to be able to state that, while strikingly few reports indicated any definite use of the scientific method, a large majority of the replies from drawing supervisors and others familiar with drawing exhibit a definite belief in its efficacy.

Analytical scrutiny. It is essential that the field of drawing be subjected to analytical scrutiny by those familiar with its various characteristics and that the significant and universal facts be used in forming a program for subsequent investigation. Experimentation will mean little if it does not fit into the general background of educational practice and conform to standards which may be widely extended in application. Drawing instruction has at the present time a vast array of definite practices and information which only await comparative and statistical analysis to become significantly important.

First of all is needed a clear-cut determination of the fundamental activities, the standards of achievement, the minimal essentials, and the open problems which current practice in drawing, psychological research, and social environment show to be typical, widespread and of immediate importance. Subsequent exper-

imentation will profit in direct proportion to the efficacy of a preliminary analysis of the facts already at hand.

Quantitative records. Quantitative records are vital to the use of the scientific method. Measurement has come to be practically a synonym for science in educational research. Comparison and corroboration require exact records, stated in commensurate forms. Drawing presents two sides in this respect. Viewed as an objective product it lends itself readily to conventional forms of measurement. Viewed as a subjective activity incidental to artistic appreciation, it requires a more refined method of measurement than has yet been evolved. There is no reason to believe that such a method will not eventually appear. The great present need is for the scientific determination of standardized objective units of measurement which may be applied in the estimation of drawing ability. The initial attempts which have been made to utilize the typical educational test, scale, and score card in the field of drawing give every encouragement as to their possible ultimate general utility.

Experimentation. Experimentation in the field of drawing may be classified as casual and controlled. Many successful methods have been discovered with no other incentive or design than that of achieving success in classroom instruction. Such casual experimentation cannot be called scientific, for it has lacked many features of the scientific method. Nevertheless, it has contributed a variety of results which offer important data for scientific study. The controlled experimental method attempts to set up definite and precise control of the various factors which enter into drawing and to measure results accordingly. Such control has varied in practice all the way from classroom experiments with a few definite points under partial control to the refined analysis possible under the technical methods of the psychological laboratory.

Judgment on the basis of observed results. The last element of the scientific method needs no comment here. It is the capstone of scientific procedure and is as fundamental in the field of drawing as elsewhere. Here, again, the great need is for measured results. When these facts are at hand the present sway of opinion

in art education will undoubtedly yield to judgment based upon scientific observation.

The application of the scientific method to drawing has been productive in three fields. By far the greater number of studies have been concerned with drawing as a spontaneous activity revealing the inner nature of childhood. Immense numbers of children's drawings from various themes have been collected and analyzed. This objective work has been supplemented by a number of careful biographical studies depicting the drawing careers of individual children. The second field of study covers a number of controlled psychological experiments which have attempted to analyze the drawing act. The factors of perception, types of imagery, memory, endowment, and training have been subjected to experimental analysis. The differing factors in representative drawing, memory drawing, and imaginative drawing have received similar treatment. The third field embraces experiments which have been conducted under schoolroom conditions and have chiefly to do with the problems of instruction in drawing. Replies to special inquiry indicate that a praiseworthy number of such studies have been undertaken by teachers in various parts of the United States. Unfortunately, the number in which available data have been kept is strikingly small. The necessity for the preservation of such data cannot be urged too strongly. It is an absolute essential in the broad program of scientific investigation which now confronts us.

III. RULES AND PRINCIPLES APPLICABLE TO DRAWING INSTRUCTION WHICH HAVE BEEN DERIVED FROM SCIENTIFIC INVESTIGATION

The rules and principles which are given below are based upon such scientific evidence as presents itself at the present time with respect to instruction in drawing. Since the scope and nature of drawing are quite complex, while the amount of experimental evidence is by comparison small, it is manifest that but few rules can be proposed and that some of these rules must be regarded as provisional. The great mass of devices and special methods receives no mention here because, while many of them are undoubtedly adapted to their immediate aims, it is impossible to summon any experimental evidence to that effect. The evidence in support of

the following principles is embodied in the literature given in the appended bibliography. The numerals in parentheses which follow each principle indicate the references which bear specifically upon it.

A. Problems Relating to the General Scope and Organization of Drawing Instruction

1. *Drawing is a spontaneous method of expression among children (4, 14, 16, 17, 18, 21, 23, 30).*

This principle is supported by a wide array of indirect and direct evidence in addition to the specified references. It may be regarded as having been established. It bears directly upon the possibility of universal instruction in drawing and the methods to be used during the earlier stages of drawing instruction.

2. *Children tend to pass successively through a number of ages or stages of drawing ability (14, 16, 17, 23, 30). These are:*

- (1) *Stage of synthetic incapacity.* Graphic juxtaposition of what the child knows.
- (2) *Schematic stage.* Symbolic representation of what the child knows.
- (3) *Stage of logical realism.* Draws not only what is seen but all there is. Schematic features retained.
- (4) *Stage of two-dimensional representation.* Visual representation which lacks perspective.
- (5) *Stage of visual realism.* Perfect three-dimensional visual representation of the individual object.

The evidence for this is conclusive. It is shown in studies of large collections of drawings and by biographical studies of individual children. These indicate that the periods do not follow age closely, that the child may be in different stages with different types of drawing at the same time, and that their progress is subject to frequent reversion.

3. *All children can learn to draw (14, 25).*

Experimental evidence from the classroom indicates that children with sufficient intelligence to pass through the grades can be carried through the final stage of drawing. Drawing in this respect seems to be similar to other school subjects.

4. *Formal instruction in drawing accelerates the speed of natural development (13, 14, 15, 16, 19, 23, 30).*

The evidence is decisive here. Statistical and experimental studies show that children 'speed up' under the stimulus of instruction. On the other hand, few individuals pass into the late stages of drawing without instruction.

5. *The rate of increase in drawing ability due to formal instruction is limited by the maturity of the child (14, 16, 20, 23, 25).*

Evidence for this principle is derived from detailed studies of the actual status of large numbers of children under instruction, from controlled experimental attempts to speed instruction, and from casual experimentation in drawing courses everywhere. It is certain that there is a loss of time and in many cases cessation of interest when particular aspects of drawing instruction are attempted too early. Evidence has not yet accumulated as to ideal times for the introduction of the various steps in drawing. It is fairly clear that exact representation should not be emphasized before the seventh or eighth year and that perspective, constructive imagination, mechanical drawing, true art interests, and formal theory may well await the approach of puberty.

6. *Ability in drawing is distributed roughly in accordance with the laws of normal frequency distribution (2, 20, 22).*

Many studies show that ability in drawing varies through a wide range among children of similar ages and training, both before and after formal instruction begins. A few cases of careful measurement of collected drawings indicate that the distributions tend to follow the so-called 'normal curve.' The evidence pertains only to drawings of similar objects.

7. *The narrative, or story-telling, interest is the predominant motive underlying the child's use of drawing as a method of expression (14, 16, 17, 23, 25, 30).*

The various biographical studies of children's drawings give direct evidence concerning the earlier stages of drawing. Statistical studies of school children and classroom experiments show that few children take an interest in the representative value of drawing in the first grade and that there is a distinct loss in emphasizing detailed appearance during this year. Insistence upon correctness of

details causes children at this age to stop using drawing as a spontaneous means of expression. The same line of evidence indicates that, if not suppressed by criticism, the narrative tendency persists and may be used from the second grade on, as a strong incentive to learn visual representation. Sargent and Miller's experiment (25) indicates that the narrative interest may be used economically as the dominant motive throughout the elementary school period of instruction. Casual experimentation suggests that other art interests may become dominant during the later years.

B. Problems Relating to Methods of Instruction

8. *Progress in ability to draw is not general but specific (19, 22, 25).*

The evidence is conflicting upon this important principle. Indirect psychological testimony and the most elaborate classroom experiment to date favor it. Direct measurement in several studies furnishes evidence against it. It has been shown that children who have been taught to draw one object well may be unable to draw other objects accurately until receiving special instruction. This indicates a necessity for a method which treats drawing as a vocabulary which must be learned one word at a time. It has also been shown that a correlation is present between specific and general ability in drawing and that there are factors common to all types of drawing. This evidence favors a general method which aims at the direct development of a general drawing skill. Each method aims to produce general drawing ability in the end. More experimental evidence is needed concerning this issue. At present the balance is in favor of the principle as stated.

9. *Training in perceptual experience and analytical observation improves drawing ability (1, 3, 12, 13, 25, 28).*

Psychological analysis proves that perception of form depends upon the previous visual experience and the method of analytical seeing which the observer brings to an object. Evidence from controlled experiments shows that a preliminary analytical study of an object improves subsequent drawing of it. Classroom experiments indicate that special devices to give perceptual experience improve subsequent drawing of difficult forms. The general ver-

dict of these experiments indicates that specific training in the perceptual observation of forms should be given as a phase of drawing instruction. The foregoing principle is most important and one that should develop rapidly in scope with further investigation.

10. *Mastery of representation of rectilinear and curvilinear objects is more effectively approached through the development of a perceptual knowledge of rectilinear and curvilinear solids than either (a) by learning the theory of perspective or (b) by drawing directly from objects and making corrections on a basis of observation (25).*

This principle is supported by the evidence of classroom experimentation and indirectly by the evidence considered in the previous principle.

11. *Relative proportions should be taught by the use of splints and training in mathematical estimates rather than by schemes of direct measurement or blocking-in methods (25).*

This rule has the support of a classroom experiment and is another extension of Principle 9 above.

12. *Children should drill in accurate memory drawing (19, 25, 28).*

This principle receives definite support from psychological analysis, classroom experimentation, and controlled test experiments. The attempt to draw from memory stimulates analytical observation, is superior to copy drawing as drill practice, and is an essential factor in developing permanent drawing ability. One line of experimental evidence is against memory drawing on the basis that the child habituates himself to inexact memory of form. This indicates the necessity for accuracy in memory drill.

13. *In learning difficult linear forms children may economize by tracing them on paper, on the blackboard and in the air, and by making cuttings both free-hand and from prepared forms (8, 25).*

This practice has been demonstrated experimentally and is a further extension of Principle 9. The perceptual experience developed with linear form by this method improves the perception required for visual representation.

14. *Ability to draw is not strengthened by modelling or by constructive work with objects (26, 28).*

Experimental evidence indicates that modelling, handling, and constructing objects interfere with visual representation and incline the drawer toward logical representation.

15. *Teachers should draw frequently before pupils (25, 26).*

This practice is supported by experimental evidence in the classroom and by a controlled experiment which indicates that this is one of the most effective methods of producing improvement.

16. *Children should be encouraged to watch each other draw and to co-operate in making composite drawings (8, 25).*

Biographical studies, statistical studies, and numerous classroom experiments indicate that drawing as a mode of expression is highly influenced through imitation and social stimulation.

17. *Children who are confirmedly left-handed should draw with the left hand (28).*

A limited amount of experimental evidence indicates that left-handed children do not develop normal ability if restricted to right-handed drawing. Evidence is insufficient concerning the advisability of developing ambidexterity in drawing.

18. *The process of representative drawing does not aid the memory or stimulate accurate observation of the object being drawn (1, 3, 23).*

Psychological analysis of the mental processes during representative drawing shows that the attention is not consciously given to an analytical study of the object. Specific memory tests prove that the mental retention of the characteristics of the objects after drawing is decidedly limited in scope and accuracy. The foregoing principle exposes one of the chief fallacies in drawing instruction, both as to aim and method. Training in analytic observation is very important to all aspects of drawing. It must, however, be secured through direct methods.

BIBLIOGRAPHY

1. Albién, Gustav. Der Anteil der nachkonstruierenden Tätigkeit des Auges und der Apperception an dem Behalten und der Wiedergabe einfacher Formen. *Zeitschrift für experimentelle Pädagogik*. V. u. VI. Bd. 1907.

2. Andrews, J. W. (Chairman). Report of committee on a scale for drawing. *Proceedings Eastern Art Association*, 1915 and 1916.
3. Ayer, Fred C. *The Psychology of Drawing*. Warwick and York, 1916. 107-168.
4. Brown, Elmer E. *Notes on Children's Drawings*. University of California, 1897. Vol. II, No. 1.
5. Bryner, Edna. A selected bibliography of certain phases of educational measurements. *Seventeenth Yearbook of this Society*, Part II, 1918.
6. Childs, H. G. Measurement of the drawing ability of 2,177 children in the Indiana City School Systems by a supplemented Thorndike scale. *Journal of Educational Psychology*, 6: Jan., 1915, 391-408.
7. Clark, A. B. The child's attitude toward perspective problems. *Stanford University Studies in Education*, 1897, Vol. I, 283-294.
8. Claussenius, Marie. Experiment in the relation of freehand pattern cutting to drawing. (Unpublished)
Miss Claussenius tested the fourth-grade children in the Francis W. Parker School in a semi-controlled experiment lasting six weeks. The children were given practice in freehand cutting of different forms. Forms were then cut freehand to illustrate the theme, "Winter Sport." Each child initiated his own pattern. Satisfactory patterns were then used in composition work. The children then drew in around the pattern forms. The children also co-operated in making composite pictures. The results show at the end of the experiment as compared with previous routine work (1) increased accuracy in drawing, (2) increased interest in drawing, (3) marked stimulus from co-operative work.
9. Dück, J. Ueber das zeichnerische und künstlerische Interesse der Schüler. *Zeitschrift für experimentelle Psychologie*. 13:1912.
10. Farnum, R. B. Present status of drawing and art in the elementary and secondary schools of the United States. *U. S. Bureau of Education Bulletin*, 1914, No. 13.
11. Ivanof, E. Recherches expérimentales sur le dessin des ecoliers de la Suisse romande. *Archives de Psychologie*. 8:No. 30. December, 1903, 97-156.
12. Judd, C. H. and Cowling, D. J. Studies in perceptual development. *Psychological Review*, 1897.
13. Katz, David. Ein Beitrag zur Kenntnis der Kinderzeichnungen. *Zeitschrift für Psych. u. Phys. der Sinnesorgane*. 1906, 241-256.
14. Kerschensteiner, Georg. *Die Entwicklung der Zeichnerischen Begabung*. Munich, 1905.
15. Kik, C. Die übernormale Zeichenbegabung bei Kindern. *Zeitschrift für angew. Psychologie*, 2:1908, 92-149.
16. Levinstein, Siegfried. *Kinderzeichnungen bis zum 14 Lebensjahr*. Leipzig, 1905.
17. Luquet, M. G. *Les Dessins d'un Enfant*. Paris, 1913.
18. Maitland, Louise. What children draw to please themselves. *Inland Educator*, September, 1895.
19. Meumann, Ernst. Die Analyse des Zeichnens und des Modellierens. In *Vorlesungen zur Einführung in die Experimentelle Pädagogik*. Leipzig, 1914. 693-775.
20. Potter, Flora B. Perspective Tests with Elementary-School Children. (Unpublished).

Miss Potter, as Supervisor of Drawing in Johnstown, Pa., gave three carefully conducted tests in perspective to large numbers of children. The first test involved the angular perspective of a book and was given to 602 children from the fifth to the eighth grade. They attempted to complete a drawing of a book from three given key lines. The resulting drawings were carefully measured, and classified by years, with grades of A, B, C, D and E. The most advanced grade, the eighth, had 60 per cent. in the D (poor) and E (failure) classes. Angular perspective of this type is difficult for these years.

The second test was similar and given to 741 children. They were given the three key lines for a drawing of a cube. Greater ability was exhibited with this form but with 23 per cent. in the eighth year, either poor or failures. The third test involved cylindric perspective of a bowl. It was given to 4,660 children in Johnstown. The test and method of grading were similar to the other tests. Her conclusion follows: "There are no pupils in 3A, 3B, and 4B who have excellent visual images of a bowl, cylindric drawing. The rate of increase is gradual; only 30 per cent. are excellent in the 8th grade."

21. Probst, M. Les Dessins des Enfants Kabyles. *Archives de Psychologie*, 6:1906, 131-140.
22. Reed, Jennie M. Correlations between special abilities in drawing. (Unpublished).

Miss Reed, a graduate student of the University of Washington, tested 30 children in the 8th drawing class of a Tacoma Elementary School in six separate types of drawing: (1) chair, (2) bowl, (3) memory drawing of bowl, (4) scissors, (5) second drawing of chair, and (6) design. The children had received no training in drawing a chair. Each set of drawings was carefully graded and ranked by three graders, and the correlations determined for the several types of drawing. The results show distinct correlations among the abilities in the four representative drawings and small correlations with memory drawings and design.

23. Rouma, G. *Le Langage graphique de l'Enfant*. Paris, 1913.
24. Rugg, H. O. A scale for measuring freehand lettering. *Journal of Educational Psychology*, 6: Jan., 1915, 25-42.
25. Sargent, Walter and Miller, Elizabeth. *How Children Learn to Draw*. Ginn and Company, 1916.
26. Sargent, Walter. Problems in experimental pedagogy of drawing. *Journal of Educational Psychology*, 3: May, 1912, 264-
27. Sargent, Walter. Summary of the recent literature on methods in art education. *The School Review*, 26: April, 1918, 297-301.
28. Stiehler, Georg. *Beitrag zur Psychologie und Methodik des Zeichnenunterrichts*. Leipzig, 1913.
29. Thorndike, Edw. L. The measurement of achievement in drawing. *Teachers College Record*. November, 1913.
30. Wagner, P. A. Das freie Zeichnen von Volksschulkindern. *Zeitschrift für angew. Psychologie*, 8:1913, 1-30.

CHAPTER VI

THE ROLE OF A CONSULTING SUPERVISOR IN MUSIC

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Musical talent is a gift bestowed very unevenly upon human beings. This talent can be measured and rated by methods available, so that any public school system may make an inventory showing at an early age of the children, not only the marked presence or absence of talent, but also the kind of talent present, with quantitative ratings.

Indeed, psychology has been so successfully applied to music in this respect that music furnishes us at the present time the most promising field for the application of scientific principles in vocational and avocational guidance. The field is new and we work without close precedent. I therefore take the liberty of outlining certain principles of economy which might be applied if a supervisor trained in the psychology of music were placed in charge of this problem.

The work of the consulting supervisor of music should consist of the following branches of endeavor: (1) survey tests in the fifth grade, (2) follow-up work, (3) individual testing and counsel, (4) organization of instruction in the schools.

I. TESTS IN THE FIFTH GRADE

We have found that the fifth grade is the best stage for this survey because the children, as a class, are able to take a responsible attitude at that age, and it is early enough to start a child in a musical education in case it may have been neglected up to that time.

This survey should comply with certain general considerations: (1) that the tests shall be such as can be made in large groups; (2)

that they shall be of such nature as practically to eliminate the effect of practice and training, age, and degree of 'normal' intelligence; (3) that they shall be as nearly 'fool-proof' as possible, both for manner of taking the record and the principles of its interpretation and application; (4) that they shall be of such a nature as to be doubly justified (*a*) for the information gathered, and (*b*) for the instruction gained through critical training furnished in the hearing of musical effects.

The tests are: (1) the sense of pitch, (2) the sense of intensity, (3) the sense of time, (4) the sense of consonance, (5) musical memory, (6) musical imagery.

Each of the six test exercises has been so arranged that a quantitative measure can be obtained in a half-hour period. The series will, therefore, require three hours in all.*

These six tests may be employed for a drag-net survey of capacities for hearing and appreciation of music. Their place in the complete analysis of musical talent is shown in the following schema of the "Elements of Musical Talent."

Elements of Musical Talent

- I. Musical Sensitivity
 - A. Simple forms of impression
 - 1. Sense of pitch
 - 2. Sense of intensity
 - 3. Sense of time
 - 4. Sense of extensity
 - B. Complex forms of appreciation
 - 1. Sense of rhythm
 - 2. Sense of timbre
 - 3. Sense of consonance
 - 4. Sense of volume

*The test material will be available in the form of phonograph disks. The first kit of such disks consists of five disk records with a booklet of instructions containing norms and directions for interpretation. The sixth test requires no apparatus and is of a different order from the other five. The entire outfit will be made available for a small price through the Columbia Graphophone Co., and with care will last indefinitely. A full account of each of these tests is found in the author's *Psychology of Musical Talent* (Silver Burdette & Co.), and a full report of a model survey of a large city is in preparation by the Iowa Child Welfare Station.

II. Musical Action

Natural capacity for skill in accurate and musically expressive production of tones (vocal or instrumental, or both) in:

1. Control of pitch
2. Control of time
3. Control of rhythm
4. Control of intensity
5. Control of timbre
6. Control of volume

III. Musical Memory and Imagination

1. Auditory imagery
2. Motor imagery
3. Creative imagination
4. Memory span
5. Learning power

IV. Musical Intellect

1. Musical free association
2. Musical power of reflection
3. General intelligence

V. Musical Feeling

1. Musical taste: likes and dislikes
2. Emotional reaction to music
3. Emotional self expression in music

As already intimated, the six tests can all be given as musical exercises in the regular course of instruction and require no outside aid. They can be given by the regular instructor in music. The reports are presented in terms of percentile rank. That is, since norms have been established, the instructor can turn to a table, such as Table I for the sense of pitch, and see at a glance what percentile rank in the normal community the child will get on the basis of his record. A graphic illustration of the data of that table is shown in Fig. 1. The conversion of "per cent. right" into "percentile rank" is illustrated in Fig. 2. For example, if an adult has 80 per cent. right judgments in Test 1, his rank in a normal community is for that capacity 30, when 100 is the highest, 50 the average, and 1 the lowest capacity found.

Similar tables and talent charts are supplied with the materials for each test. The final reports may be put into graphs as in Fig. 3, which contains six cases, taken at random from a large collection

TABLE I
CONVERSION OF THE PERCENT RIGHT OF A RECORD INTO PERCENTILE RANK, VIBRATION
DIFFERENCE, TONE DIFFERENCE, AND FREQUENCY IN THE GROUP

Percent Right	Percentile Rank	Vib. Diff.	Tone Diff.	Percent in Group
100	100	.2	.004	5
99	100	.3	.005	
98	99	.4	.007	
97	98	.5	.009	
96	97	.6	.01	
95	96	.7	.01	20
94	94	.8	.01	
93	91	.9	.02	
92	87	1.0	.02	
91	82	1.2	.02	
90	76	1.4	.03	28
89	70	1.6	.03	
88	64	1.8	.03	
87	58	2.1	.04	
86	53	2.4	.04	
85	48	2.7	.05	19
84	43	3.0	.06	
83	39	3.3	.06	
83	35	3.6	.07	
81	32	3.9	.07	
80	29	4.2	.08	12
79	26	4.6	.09	
78	23	5.1	.10	
77	21	5.7	.11	
76	19	6.3	.12	
75	17	7.0	.13	7
74	15	7.7	.14	
73	13	8.5	.16	
72	12	9.2	.17	
71	11	10.4	.19	
70	10	11.2	.21	4
69	9	12.3	.23	
68	8	13.4	.25	
67	7	14.5	.27	
66	6	15.6	.29	
65	6	16.8	.31	3
64	5	18.1	.34	
63	5	19.4	.36	
62	4	20.8	.39	
61	4	22.3	.41	
60	3	23.8	.44	1
59	2	25.4	.47	
58	2	27.0	.50	
57	2	28.7	.53	
56	2	30.4	.56	
55	2	32.2	.59	1
54	1	34.0	.63	
53	1	36.0	.66	
52	1			
51	1			
50	0			

of records of school children, who show high musical ability in these measurements. Space does not permit discussion of details, but each case presents its own peculiarities, and every feature in each chart is significant.

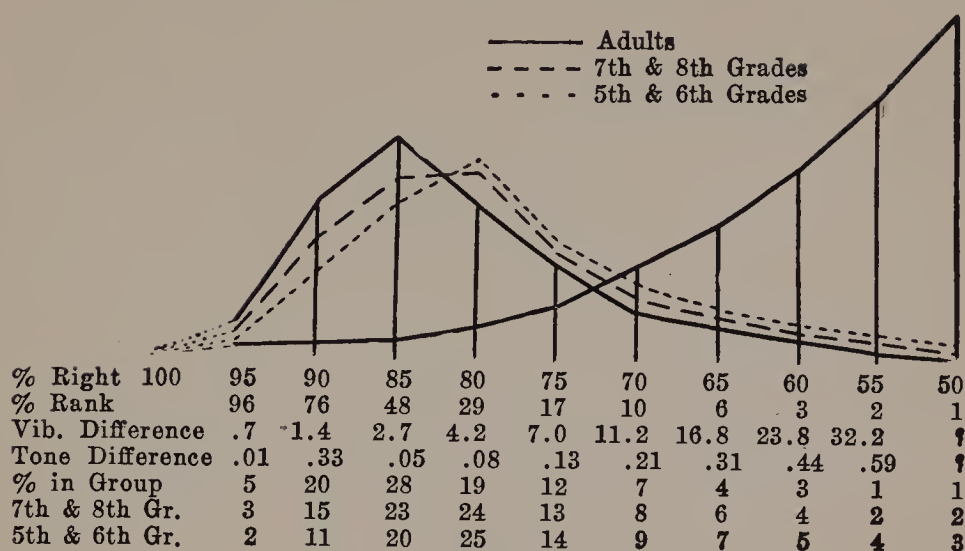


Fig. I

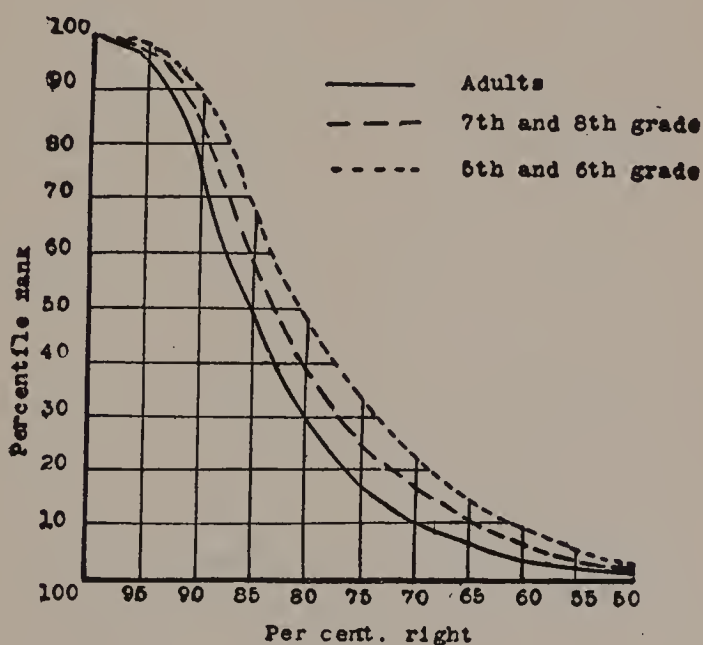


Fig. II

The last three items in Fig. III represent not measurements, but the teachers' estimates in conference on (1) brightness, defined as ability to do school work if he tries, (2) ability to sing, and (3)

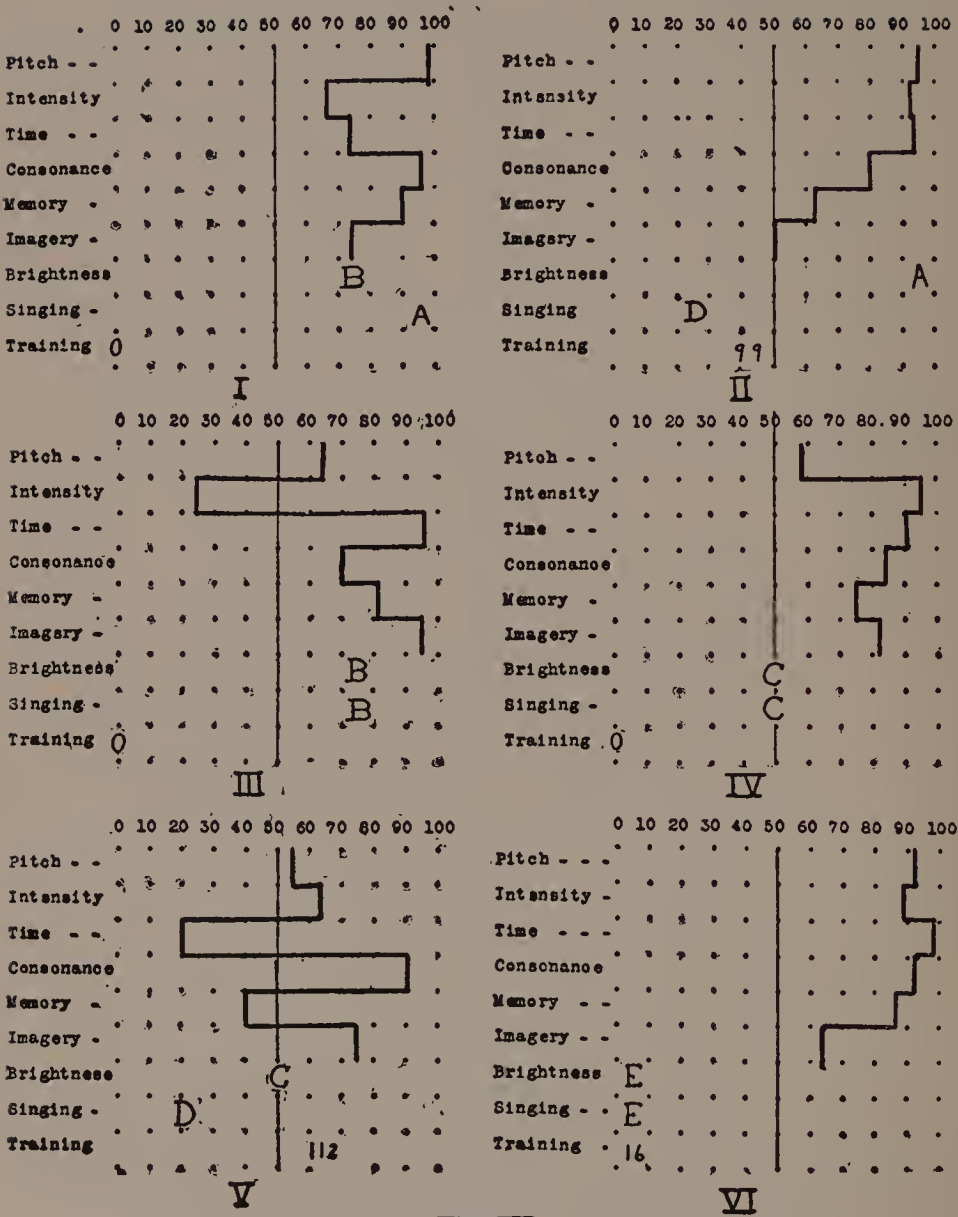


Fig. III

the number of whole hours of private music lessons the pupil has had. Percentile rank is shown at the top of each of these six charts.

The records of children in any school will show some very astonishing results, among which the following may be mentioned: (1) There are enormous differences among individuals. In the sense of pitch, for instance, one pupil may have two hundred times the natural capacity of another. (2) None of the six capacities here measured shows any marked correlation with intelligence as indicated by the intelligence quotient. (3) The variation with age is small and secondary. Such variation as we do find is due to lack of application rather than to absence of capacity. (4) Each of these capacities is independent of the other, *i. e.*, a child may be superior in one capacity and inferior in one or more of the other talents; we discover types (kinds) of musical capacity. (5) These types and quantitative ratings are permanent personal equations. After a fair test at the age of ten, we can pronounce upon the capacity which may be predicted for the rest of life. Talent is not a thing to be acquired; it is a gift, inborn. (6) There is but very slight correlation between the amount of musical education given and the possession of musical talent. (7) A very large percentage of superior musical talent was undiscovered before being revealed by the tests. These few gleanings from a large array of findings may suffice to show the practical significance of the data.

II. FOLLOW-UP WORK

One important function of the consulting supervisor in music is to interpret and organize the transmission of these results to parents, pupils, and music teachers. Since the chief interest is in the discovery of unknown talent, activities should center around the selection of exceptional musical talent. For example, lists of the best 10 per cent., 25 per cent., and 50 per cent., respectively, may be made, and the result for each child concerned may be communicated to the parents and music patrons. If, for example, the child is taking music seriously, and is classified in these tests as in the best 10 per cent., the encouragement of that report may be worth a great deal. On the other hand, if unknown talent of such high order is discovered, the interest of parents, pupils, music teach-

ers, and patrons of music in the community should be aroused. We shall be conserving human energies by awakening dormant talents. Herein lies the chief benefit of the tests. The supervisor should not guarantee absolutely, on the basis of these tests, that musical talent exists, because the pupils may have any one of a great variety of impediments not revealed by the tests. But, as in the case of preventive medicine, the pupil should always be turned to the expert—in this case the music teacher.

Children who have been examined and their parents should be entitled to conferences with the consulting supervisor. These interviews will afford opportunity for stimulating interest in musical facilities for the gifted.

The instructor of music in the schools should use this drag-net evidence in selecting material for choruses, orchestras, bands, and other musical organizations.

III. INDIVIDUAL CONSULTATION

1. *The open day.* The consulting music supervisor should have one day a week devoted to the giving of these tests to persons who are specially interested in finding out for themselves what their abilities are in music and who do not come within the scope of the survey in the fifth grade. This is a legitimate community service for which perhaps a small fee should be charged.

2. *The consultation day.* The supervisor should devote one day to the further testing and analysis of particularly meritorious cases which deserve intensive examination and of cases which might be sent by teachers for the analysis of peculiar difficulties. For the first of these two classes a reasonable fee should be charged, but this fee should always be waived for good cause among the poor.

Fig. 4 is a talent chart worked out in detail. The data in the chart may be paraphrased as follows:

Theodora has a decidedly musical mind. In the three basic capacities for musical hearing—the sense of pitch, the sense of intensity, and the sense of time, she is superior and well balanced. Her sense of rhythm is of a high order. Her acuity of hearing is only average, but this condition is not of the type which will affect music seriously in view of her superior sensory powers, and

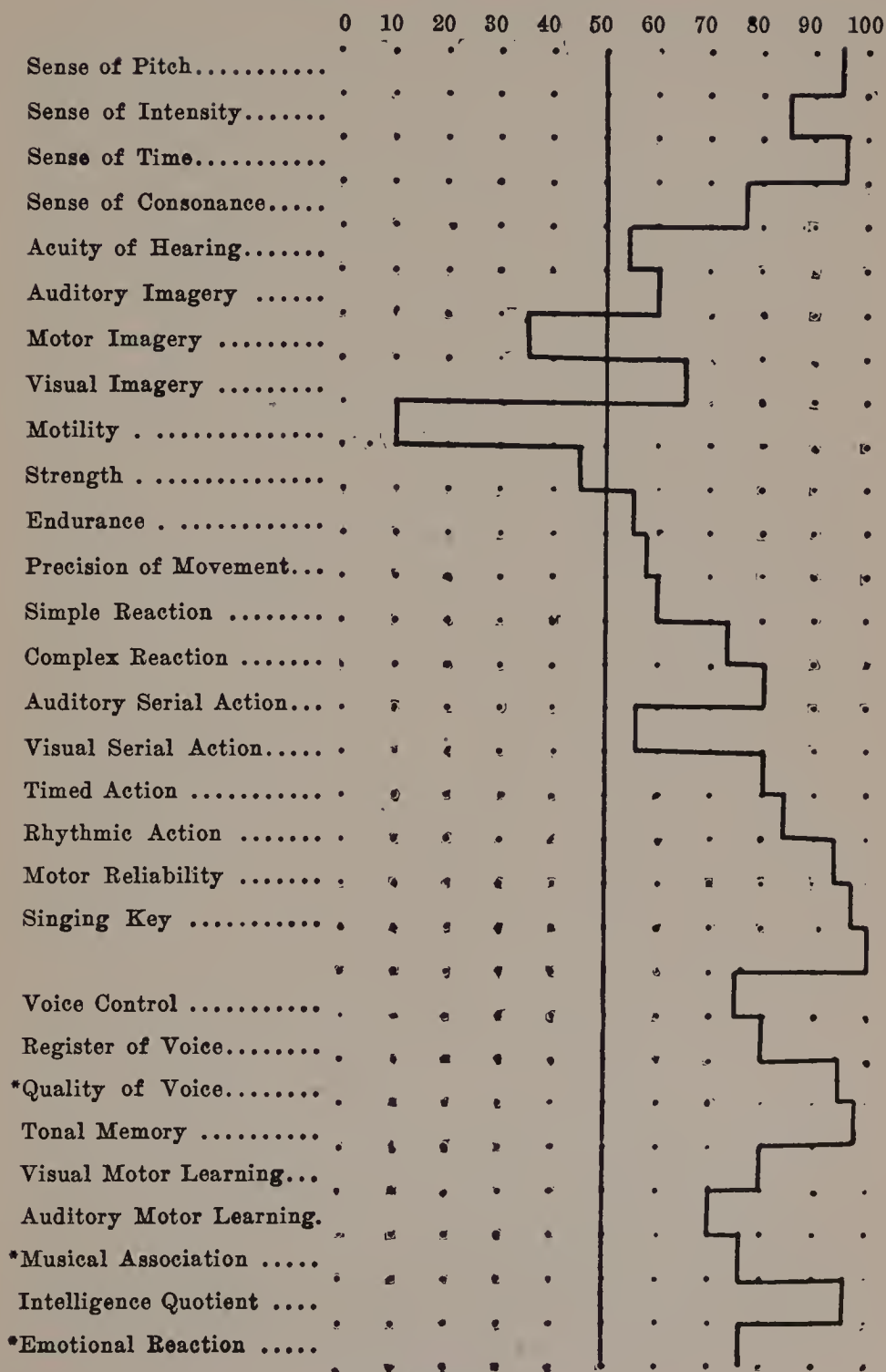


Fig. IV

her motor and visual imagery are prominent enough for an emotional background in music. Her lowest record is on motility, which is characteristic of the fact that she has a deliberate type of mind and is steady and reliable in her movements. Her physique is average, as is indicated by her grip and ergogram. Her precision of movement and her simple response to a simple signal are slightly above average; while her simple response to a complex signal is decidedly better. Her capacity for serial association of sound and action is good; whereas her association for visual impressions and action is barely above average; her timed action and her rhythmic action are both good. Her general reliability is superior. She sings in key with remarkable ability, and reproduces the interval with superior precision, although her voice control is only moderately good for nuances of pitch. She has a good voice register and an excellent voice quality. Her tonal memory is decidedly superior. She gives superior promise for speed and reliability in the acquisition of skill in music. Her associations are highly versatile and remarkably well balanced, but not peculiarly musical. Her mental age is fully two years in advance of the normal. Emotionally she is cool and undemonstrative, but capable of deep feeling for music.

Generalizing from the above, we observe that Theodora has a rare balance of high sensory capacities for music, that she is of the strongly intellectual, rather than of the motor type of mind and that, therefore, she is not so skillful in performance as she is in hearing, appreciation, and intellectual control. Her motor responses are of the slow, deliberate, and reliable type.

Theodora belongs to a decidedly musical family and is given excellent musical advantages. On account of her remarkable versatility in other respects, she approaches music, like other interests, in a matter-of-fact attitude.

Frequently the consulting psychologist can identify the natural cause of failure to make progress, or of peculiar defects in musical performance or appreciation by a trial examination, even without instruments. The consulting supervisor will soon be supplemented by professional psychologists in music.

The gradual discovery of ratings of musical talents in a community will tend to awaken the community to a realization of its

possibilities, responsibilities, and privileges with reference to the conservation of musical talent. It will be a large function of the music supervisor to guide this new enthusiasm within reasonable limits.

The consulting supervisor should not be formal in dictating vocational or avocational guidance; he should rather occupy the position of being the distributor of information about existing talents. It is one thing to say what kinds and degrees of talent the pupil has; it is quite another to say what he should do with these. In so far as possible the function of the consulting supervisor should be limited to the former. Responsibility for the latter should be thrown upon the music teacher.

This new responsibility for the music teacher will result in a new awakening in the musical profession to the recognition of the existence of specific and fixed natural capacity for music in the form of talents, and the recognition of the principle that, in so far as possible, the facilities for musical education of a high order should be proportionate to the possession of musical talent. Great benefits will accrue to the musical profession by the discovery of musical talent in a comprehensive survey of children at an early age.

IV. ORGANIZATION OF INSTRUCTION IN THE SCHOOLS

The present prevailing method of classifying pupils for instruction in music on the basis of age or achievement in arithmetic or history, must soon become obsolete, because it is a gross violation of the first principle of educational psychology; namely, *keep the child busy at his highest level of achievement*.

The old method is not only shamefully wasteful in time, but it has a demoralizing effect upon talented and untalented child alike. All admit that it is not good for a child who is superior in singing to be held in leash by an artificial classification. It is not so generally known, but it can be demonstrated beyond question, that psychologically the effect of such alignment is always bad for the child of *inferior* musical endowment. If the training is above his level, it creates a feeling of self-depreciation and disgust, and it fails to give the child that musical stimulus which can reach him. The old argument that it is good for the inferior singer to be

trained with the superior singer is false, both from the point of view of economy of time and from the point of view of the development of musical appreciation and the will to achieve.

The classification of children in the grades for technical instruction in music must be based upon the capacity for achievement in such music—not on arithmetic, sight reading, age or height. This is my fundamental proposition. It is the first unequivocal demand of educational psychology. It is humane.

The classification should be based upon the rating of children on progress in singing or other music, supplemented by the rating obtained in the before-mentioned tests. The tests may draw out many cases of superior ability which remain latent under the old non-competitive system.

Two principles should be taken into account: (1) that each pupil should be given instruction in music at his level of attainment, and (2) that, other things being equal, extra privileges in music should be given in proportion to the possession of talent.

The second of these principles can be followed through the maintenance of voluntary organizations, both vocal and instrumental, for all grades. It is manifest that the efficiency gained by such voluntary training should be recognized by promotion in the regular training course whether taken in study hours or outside. Likewise, the efficiency gained through private instruction should be recognized in the classification for regular training.

Compliance with these principles requires a flexibility in the grouping for musical instruction in all grades from the primary upward, which is a serious problem in administration. There are two ways of meeting that situation. One is to provide the music at such hours for the different groups that there can be the greatest freedom of crossing class lines. For example, some of the first-grade pupils may be assigned to the fourth grade in singing, and some fourth-grade pupils may be held back even in the first grade until the standards of the grade have been met. Standards should be based primarily on the ability to sing. The sight reading can be learned rapidly by pupils who have ability and interest in music. Standards for sight singing should not be lowered; however, sight reading in itself is not music.

But this system of promotion does not meet the real need. It still keeps the musical and unmusical tied together and increases the humiliation of those who progress very slowly. It fails to meet the real need, which is to bring together, as nearly as possible, those of the same degree of natural musical ability.

The true solution, both in economy of time and efficiency of achievement, may be gained by carrying, either for each grade, or preferably for a small group of grades, three divisions, roughly as follows: the superior 25 per cent., the middle 50 per cent., and the inferior 25 per cent., with continual shifting from one division to another as merit may warrant. This, with free promotion or demotion, would make a happy solution.

But there is no universal solution for this program shift. Each superintendent and principal must find a solution adapted to the needs and resources of the school. The solution does not lie in mere promotion. The problem is how to get children grouped for training in music on the basis of fitness for music. It should be the function of the consulting supervisor of music to be in frequent conference with makers of programs and with teachers of music for the purpose of developing such a system in the grades.

BOUND VOLUMES
OF
THE YEARBOOKS OF THE SOCIETY
I-XXIX

The yearbooks of the National Society for the Study of Education form the outstanding feature of its activities. In the earlier days of the Society these publications were comparatively small in size, though not in importance of their topics or in authoritative-ness of their producers. From the first, the policy was adopted of issuing the yearbooks in advance of the meeting at which they were to be discussed. As long as the membership of the Society was limited to a small group of active participants, the annual meetings were perhaps of even more importance than the printed material which formed the subject matter for discussion. But as the Society's membership increased and as the number of non-members attracted to its meetings also increased, the difficulty of holding these intimate discussions likewise increased, the meetings gradually shifted in character, so that the formal presentation of addresses came to assume more, and the discussions less importance—a change which many members deplored, but which it has seemed impossible to avoid. At the same time, the commercial sales of yearbooks not distributed to members in return for their dues correspondingly increased and gradually affected the functions of the Society in ways that could hardly have been foreseen at the outset. More particularly, the financial returns from the sales of its yearbooks have produced for the Society a source of income which has increased like the proverbial snowball, and which has brought it about that the Society is to-day in some respects more nearly a publishing society than a society for the holding of meetings and discussion of educational topics. In other words, the production and distribution of its yearbooks, rather than the holding of its annual meetings, has come to be the chief method by which the Society is now influencing the trend of educational thinking and practice. As will be seen by a glance at the statements given in the annual reports of the Secretary, the sums now available to the Society from the sale of its yearbooks have reached very considerable proportions. The policy of the officers of the Society has been consistently to return these profits to the members of the Society,

partly by issuing yearbooks that often cost more to deliver to its members than the dues received in return, partly by subsidizing more effectively the work of the various committees that are at work upon the production of forthcoming yearbooks.

All in all, then, the yearbooks of the National Society for the Study of Education are in many respects a feature unique among educational organizations. As to their intrinsic worth as educational documents, there need be no argument; their ready sale, the repeated requests for permission to quote from their pages, and the numerous enthusiastic unsolicited endorsements from our members are sufficient testimony.

SUMMARY OF YEARBOOKS I-XXIX

The following is a list of the fifty-six books published to date (1930) together with the names of the contributors and a brief synopsis of the contents of each book. Perusal of this summary will show the scope and importance of the Society's publications.

VOLUME ONE

THE FIRST YEARBOOK, PART I (1902)

SOME PRINCIPLES IN THE TEACHING OF HISTORY

Lucy M. Salmon

This first yearbook of the Society is a concise and stimulating discussion of the principles underlying the teaching of history. The author devotes various sections of the paper to a discussion of the place of the sources in the school course, the historian in relation to the selection of materials, the relation of history to other subjects, and changes in the methods of teaching it. The concluding section gives an outline of the history recommended for use in the twelve grades.

THE FIRST YEARBOOK, PART II (1902)

THE PROGRESS OF GEOGRAPHY IN THE SCHOOLS

W. M. Davis and H. M. Wilson

Some of the best principles which govern the teaching of geography to-day are set forth in this early yearbook of the Society. Mr. Davis, the author of the major portion of the volume, deplors the deficiency of higher learning in the field, urges better training of teachers in the subject matter, stresses the need of subordinating detailed items to general principles, points out the importance of showing causal relations in teaching the subject, and advocates better and more extensive use of equipment of geographical laboratories. Some space is devoted to a discussion of ontology, systematic and regional physi-

ography, and systematic and regional geography, with brief reference to their places in the curriculum. The concluding chapter, by Mr. Wilson, discusses the relation of geography to the sciences.

THE SECOND YEARBOOK, PART I (1903)

THE COURSE OF STUDY IN HISTORY IN THE COMMON SCHOOLS

Isabel Lawrence, Charles A. McMurry, Frank McMurry,
Edward C. Page, and Emily J. Rice

The major portion of this yearbook is devoted to a course of study in history for grades three to eight inclusive, prepared by Charles A. McMurry. Particular recognition is given to the intimate relation between history and reading and geography. A brief course in geography is outlined for use with the subject matter in history and reading. The final chapters of the volume are a series of interesting papers discussing Miss Salmon's presentation of the principles of teaching history, which appeared as Part I of the First Yearbook.

THE SECOND YEARBOOK, PART II (1903)

THE RELATION OF THEORY TO PRACTICE IN EDUCATION

David Felmley, Manfred J. Holmes, John A. Keith, and Levi Seeley

Under the chairmanship of John A. Keith, a committee of the Society undertook a careful study of the relation of theory to practice in education in (a) universities, (b) normal schools, and (c) city training schools. The plans of the committee embraced a historical account of earlier procedure in each of these types of institutions, an account of contemporary procedure, an investigation of the most effective relation of theory to practice under various forms of institutional organization, and a study of the relative values and essentials of some nine fields of subject matter offered in those institutions. This yearbook is devoted largely to the Committee's report on the situation in the normal schools.

THE THIRD YEARBOOK, PART I (1904)

THE RELATION OF THEORY TO PRACTICE IN THE EDUCATION OF TEACHERS

Sarah C. Brooks, John Dewey, C. H. Farnsworth, F. M. McMurry,
G. R. Richards, D. E. Smith, and T. D. Wood

This yearbook consists of three sections: (1) a paper by John Dewey, entitled "The Relation of Theory to Practice in Education," (2) further treatment of the same topic in a paper by Sarah C. Brooks, and (3) a description of the "Theory and Practice at Teachers College, Columbia University" by the remaining contributors. The secretary's report, referring to the meeting at which this yearbook was discussed, states: "The entire time was devoted to the discussion of Dr. John Dewey's paper. . . . This paper stirred up a good deal of vigorous thinking and provoked a great deal of highly valuable discussion." Dr. Dewey pointed out the artificiality of the conditions under which so-called practice is secured in those situations where young teachers gain

their experience by taking immediate control of a room under the observation of a superior supervisory officer. As a substitute for this method, he proposed that while the student was acquiring his knowledge of subject matter, theory, and principles, he should devote long periods to the observation of both skilled teachers and children at work in the classroom. This was to be followed by an assistantship to the teacher, which should lead gradually to experience in actual teaching.

THE THIRD YEARBOOK, PART II (1904)

NATURE STUDY

Wilbur S. Jackman

The author of this yearbook has three objects in mind: to show (1) that nature study must be presented in accordance with the general principles of psychology which apply to all other subjects; (2) that it is necessary to start with broad, general views or pictures of nature and proceed gradually to the details; and (3) that nature study forms but a part of education, since its relationships reach into all other subjects which go to make up the whole. He suggests salient centers of subject matter and points out principles of method, carrying through the whole a due regard for the needs of the young and growing mind. The book is illustrated and contains a suggestive course of study.

THE FOURTH YEARBOOK, PART I (1905)

THE EDUCATION AND TRAINING OF SECONDARY TEACHERS

S. D. Brooks, J. F. Brown, J. S. Brown, C. DeGarmo, E. G. Dexter, E. C. Elliott,
C. B. Gilbert, G. S. Hall, R. P. Halleck, M. J. Holmes, E. J. James,
L. H. Jones, L. C. Lord, A. F. Nightingale, M. V. O'Shea,
H. H. Seerley, C. C. Van Liew, and J. N. Wilkinson .

The two central problems of this yearbook are: (1) What constitutes the ideal secondary teacher?; and (2) By what selective process and preparation can the realization of this ideal be promoted? These problems are considered under five divisions: (1) an historical sketch, which seeks to trace briefly the genesis of secondary schools in their relation to the life of the people; (2) a presentation of the opinions of five experienced secondary-school men as to what constitutes the ideal secondary-school teacher; (3) an examination of the status and personnel of secondary teachers in the United States; (4) a survey of the provisions for the preparation of secondary-school teachers made by universities, normal schools, and colleges; and (5) a consensus of opinion as to the relative advantages and limitations of universities and normal schools in preparing secondary-school teachers.

THE FOURTH YEARBOOK, PART II (1905)

THE PLACE OF VOCATIONAL SUBJECTS IN THE HIGH-SCHOOL CURRICULUM

J. Stanley Brown, Gilbert B. Morrison, and Ellen H. Richards

Three main groups of vocational studies have been treated in this yearbook: commercial work, manual training, and domestic science. These topics

are discussed in relation to their then present status, and their possibilities for future development. The concluding chapters of the book are devoted to a discussion of Part I of the Fourth Yearbook.

VOLUME TWO

THE FIFTH YEARBOOK, PART I (1906)

ON THE TEACHING OF ENGLISH IN ELEMENTARY AND HIGH SCHOOLS

George P. Brown and Emerson Davis

This yearbook opens with a theoretical dissertation on what Mr. Brown considers the philosophical background for the efficient teaching of English. From this he proceeds to a more practical discussion of methods of teaching English in the primary and grammar grades and in the high school. The latter part of the book describes the course of study in English in the primary grades of the public schools of Cleveland.

THE FIFTH YEARBOOK, PART II (1906)

THE CERTIFICATION OF TEACHERS

Ellwood P. Cubberley

This yearbook sets forth in some detail the conditions prevailing in 1906 with reference to the certification of teachers, traces the development of certain tendencies relating to the problem, and offers suggestions as to lines along which improvement might be made.

THE SIXTH YEARBOOK, PART I (1907)

VOCATIONAL STUDIES FOR COLLEGE ENTRANCE

W. J. S. Bryan, C. A. Herrick, H. W. Holmes, T. de Laguna, and
V. Prettyman

Continuing the discussion begun in Part II of the Fourth Yearbook, this yearbook takes up those aspects of vocational subjects relating to college entrance.

THE SIXTH YEARBOOK, PART II (1907)

THE KINDERGARTEN AND ITS RELATION TO ELEMENTARY EDUCATION

Ada Van Stone Harris, Patty S. Hill, E. A. Kirkpatrick, Maria Krause-Boelté,
Harriette M. Mills, and Nina C. Vandewalker

This yearbook is devoted to an investigation of the relation between the kindergarten and elementary school. It was undertaken in order to further the effort to establish the kindergarten more firmly as a part of the public-school system by bridging the chasm which existed between it and the primary grades. It contains a résumé of Froebelian principles, a presentation of both the conservative and the progressive phases of kindergarten education, the history of kindergarten influence in elementary education, and a discussion of the evolution of the kindergarten program.

THE SEVENTH YEARBOOK, PART I (1908)

THE RELATION OF SUPERINTENDENTS AND PRINCIPALS TO THE TRAINING AND PROFESSIONAL IMPROVEMENT OF THEIR TEACHERS

Charles D. Lowry

This yearbook is largely a summary of replies to a questionnaire sent to members of the Society and others, asking (1) for opinions as to the need for carrying on systematic work for training the teaching force to a higher degree of efficiency, and (2) for statements of the nature of such work in those schools in which it was carried on. The replies pointed to the conclusion that the greatest essential for a teacher's life and growth is vigorous, systematic study, preferably in courses under the direction of higher institutions of learning. Various plans for attaining this result are presented in this volume.

THE SEVENTH YEARBOOK, PART II (1908)

THE COÖRDINATION OF THE KINDERGARTEN AND THE ELEMENTARY SCHOOL

Margaret Giddings, B. C. Gregory, Jennie B. Merrill, and Bertha Payne

"Supplement to Sixth Yearbook, Part II" is the secondary title of this yearbook. Following the somewhat theoretical discussion of the problem set forth in the earlier yearbook, this one attacks the more practical consideration of how to coördinate the work of the kindergarten and the school. It discusses ways and means of securing organic continuity between the two, shows how the right training of teachers may further the work of coördination, and sets forth the relation of supervision to the question at issue.

THE EIGHTH YEARBOOK, PART I (1909)

EDUCATION WITH REFERENCE TO SEX: PATHOLOGICAL, ECONOMIC, AND SOCIAL ASPECTS

Charles Richmond Henderson

THE EIGHTH YEARBOOK, PART II (1909)

EDUCATION WITH REFERENCE TO SEX: AGENCIES AND METHODS

Charles Richmond Henderson and Helen C. Putnam

The two parts of the Eighth Yearbook are meant to be considered as a single study. In Part I of the study evidence, drawn from the testimonies and experiences of well-known physicians and social hygienists, is offered to reveal the urgent need for instructing youth in sex hygiene. Part II gives practical suggestions to parents and teachers regarding formal instruction in matters of sex. The study concludes with a helpful paper by Dr. Putnam, entitled "Sex Instruction in the Schools," which is devoted chiefly to showing how this instruction may be presented in the school naturally and wholesomely in connection with biology.

VOLUME THREE

THE NINTH YEARBOOK, PART I (1910)

HEALTH AND EDUCATION

Thomas Denison Wood

A brief synopsis is given in this yearbook of the different phases of educational administration, supervision, and instruction which have to do with health. It treats of health examinations, school sanitation, the hygiene of instruction, health instruction, and physical education. A helpful bibliography concludes the volume.

THE NINTH YEARBOOK, PART II (1910)

THE NURSE IN EDUCATION

M. Adeline Nutting, Mary L. Read, Isabel M. Stewart, and Thomas D. Wood

Supplementing the discussion in Part I, this volume is devoted to the rôle in education of the professionally trained nurse. It presents some of the important results attained in this field, outlines the scope and possibilities of the work, suggests the relationship of the nurse to the community, and indicates the coördination of the nurse's work with that of parent, regular teacher, school physician, teacher of physical education, and other special teachers whose particular subjects bring them into relation with the health side of education.

THE TENTH YEARBOOK, PART I (1911)

THE CITY SCHOOL AS A COMMUNITY CENTER

C. W. Crampton, Mrs. E. C. Grice, Mrs. S. E. Hyre, H. C. Leipziger,
C. A. Perry, E. W. Stitt, E. J. Ward, and R. D. Warden

The contributors to this volume have described in a concrete way the extent and character of experiments carried on under their direction for making the school a community center. They include in their discussion methods employed, results secured, concrete incidents, difficulties, criticisms, and suggestions encountered in their experiments, together with comparisons of similar work conducted in other communities.

THE TENTH YEARBOOK, PART II (1911)

THE RURAL SCHOOL AS A COMMUNITY CENTER

E. C. Bishop, B. H. Crocheron, B. M. Davis, Jessie Field, A. B. Graham,
F. W. Howe, O. J. Kern, and M. T. Scudder

This volume supplements Part I, and treats in a similar manner the problems and considerations involved in making the rural school a community center. It concludes with a bibliography on city and rural schools as social centers.

THE ELEVENTH YEARBOOK, PART I (1912)

INDUSTRIAL EDUCATION: TYPICAL EXPERIMENTS DESCRIBED AND INTERPRETED

J. F. Barker, M. Bloomfield, B. W. Johnson, P. Johnston, L. M. Leavitt,
G. A. Mirick, M. W. Murray, C. F. Perry, A. L. Safford,
and H. B. Wilson

In this yearbook an attempt is made to bring together accounts of actual progress made in organizing schools for industrial education, to interpret the various lines of experimentation undertaken, and to demonstrate practical possibilities. Each contributor was requested to describe the history, organization, and results of industrial education in his school, to compare his with other schools of the same type, and to show how his particular type of undertaking might contribute toward the whole problem of industrial education. (See the Twenty-Third Yearbook, Part II, for further treatment of this topic.)

THE ELEVENTH YEARBOOK, PART II (1912)

AGRICULTURAL EDUCATION IN SECONDARY SCHOOLS

H. F. Button, F. R. Crance, D. J. Crosby, W. H. French, W. R. Hart,
A. C. Monahan, R. W. Stimson, and G. F. Warren

The aim of this yearbook was to present accounts of what was actually being done in secondary agricultural training in various parts of the United States at the time it was prepared. It represents an analysis of the typical experiments which were under way at that time, and gives some interpretation of each plan and its results.

THE TWELFTH YEARBOOK, PART I (1913)

THE SUPERVISION OF CITY SCHOOLS

Franklin Bobbitt, John W. Hall, and J. D. Wolcott

Professor Bobbitt, who contributes the major portion of this yearbook, treats the question of supervision under seven main heads, the most important of which are: the need for definite standards of achievement (with special reference to achievement tests); the necessity of determining under actual conditions the most efficient methods for actual service, and then insisting upon them; the importance of standard qualifications for teachers, with some account of a rating scale; the need for standard preliminary training of teachers; the need for training during service; and the importance of defining for teachers the extent, standards, and methods of work that are expected. The appendix, by Professor Hall, gives an account of the supervision of beginning teachers in Cincinnati. Mr. Wolcott contributes a bibliography on city-school supervision.

THE TWELFTH YEARBOOK, PART II (1913)

THE SUPERVISION OF RURAL SCHOOLS

A. S. Cook, J. Davis, L. J. Hanifan, U. J. Hoffman, W. Lund, A. C. Monahan,
E. M. Rapp, J. E. Warren, and J. D. Wolcott

This is the third yearbook of the National Society to deal with an important phase of the administration of rural schools. The several authors

give accounts of what was actually being achieved in typical situations in various parts of the United States at the time the yearbook appeared.

VOLUME FOUR

THE THIRTEENTH YEARBOOK, PART I (1914)

SOME ASPECTS OF HIGH-SCHOOL INSTRUCTION AND ADMINISTRATION

E. R. Breslich, L. D. Coffman, W. A. Jessup, and H. C. Morrison

The three sections of this yearbook are devoted to a discussion of reconstructed mathematics, supervised study, and North Central High Schools, respectively. The first discusses very concretely needed re-adjustments in the subject of mathematics. The second presents the fundamental principles at the basis of the movement for supervised study, together with a review of the experiments that had been tried in various parts of the country. The last paper shows that a clear understanding of existing conditions with respect to the quality of the teaching staff is one of the most important steps in the direction of reconstruction of the subjects of the curriculum.

THE THIRTEENTH YEARBOOK, PART II (1914)

PLANS FOR ORGANIZING SCHOOL SURVEYS, WITH A SUMMARY OF TYPICAL SCHOOL SURVEYS

Charles H. Judd and Henry L. Smith

The first paper in this volume treats the problem of school surveys from three angles: the conditions necessitating careful study of local school situations; the forces that can most safely and profitably be intrusted with making local surveys; and a possible method of approach to the problem in cities of from five to fifty thousand inhabitants. The second paper, by Professor Judd, includes accounts of all major surveys up to 1914, and gives a view of the different types of such inquiries.

THE FOURTEENTH YEARBOOK, PART I (1915)

MINIMUM ESSENTIALS IN ELEMENTARY-SCHOOL SUBJECTS—STANDARDS AND CURRENT PRACTICES

W. C. Bagley, S. A. Courtis, F. N. Freeman, W. S. Gray, H. W. Holmes,
J. F. Hosic, W. A. Jessup, R. G. Jones, H. C. Pryor,
F. E. Thompson, and H. B. Wilson

This yearbook is the 1915 report of investigators coöperating with the Committee of the Department of Superintendence of the National Education Association on Economy of Time in Education, H. B. Wilson, chairman. Three other important yearbooks of the Society (XVI, Part I; XVII, Part I; and XVIII, Part II) are devoted to the subsequent reports of this important committee. This report has to do with means of developing a program for economizing time in the elementary school. A general survey is presented, showing how time is at present distributed in representative cities and describing typical experiments for gaining economy. The bulk of the report

deals with minimal standards in reading, handwriting, spelling, composition, grammar, arithmetic, geography, history, and literature, and represents a series of efforts by different contributors to determine for these subjects just what topics or aspects are truly essential.

THE FOURTEENTH YEARBOOK, PART II (1915)

METHODS FOR MEASURING TEACHERS' EFFICIENCY

Arthur C. Boyce

The author of this monograph calls attention first to the need for rating teachers and to the many inadequacies of the schemes for rating that are in common use. To meet this need and overcome these weaknesses, he proposes a method for rating which features a selected list of traits, a careful definition of these traits, and a graphic method for doing the rating. He also sets forth the results obtained by his method and discusses the relative importance of the several qualities of merit in teachers. Mr. Boyce's rating scale has attracted much attention and, in its original form or with variations, has been employed in the rating of large numbers of teachers.

THE FIFTEENTH YEARBOOK, PART I (1916)

STANDARDS AND TESTS FOR THE MEASUREMENT OF THE EFFICIENCY OF SCHOOLS AND SCHOOL SYSTEMS

B. T. Baldwin, F. W. Ballou, D. C. Bliss, B. R. Buckingham, H. G. Childs, S. A. Courtis, E. P. Cubberley, C. H. Judd, George Melcher, E. E. Oberholtzer, J. B. Sears, Daniel Starch, G. D. Strayer, M. R. Trabue, and G. M. Whipple

This volume is the report of the Committee of the National Council of Education of the National Education Association, under the chairmanship of G. D. Strayer, assisted by several invited collaborators. The fifteen chapters are grouped into two sections. Section I deals with the derivation of scales and units of measurement, including scales for physical growth and for arithmetic, score cards for city school buildings, and completion tests for school use. Section II deals with the application of scales and units of measurement in the work of educational supervision and administration. Among the systems from which accounts of the use of measuring scales are reported are Boston; Montclair; Bloomington, Indiana; Detroit; Salt Lake City; Kansas City, Missouri; Tulsa, Oklahoma; Oakland, California; Cleveland, Ohio; and Madison, Wisconsin.

VOLUME FIVE

THE FIFTEENTH YEARBOOK, PART II (1916)

THE RELATIONSHIP BETWEEN PERSISTENCE IN SCHOOL AND HOME CONDITIONS Charles E. Holley

The author of this monograph investigated on a fairly comprehensive scale the question: What factors determine the number of years of schooling

received by pupils in the public schools? Among the conclusions reached are these: (1) There is a high correlation between the general cultural advantages of a home and the schooling the children will receive. (2) Environmental influences more often cause a child to stop attending school than lack of ability. (3) Early elimination from school is largely due to factors over which the school has little or no control. (4) High schools are largely attended by the children of the "better class." (5) Marriages are distinctly affected by "educational selection." (6) A family tradition of schooling is effective in inducing unusual persistence in school in some cases.

THE FIFTEENTH YEARBOOK, PART III (1916)

THE JUNIOR HIGH SCHOOL

Aubrey A. Douglass

This monograph, which is accompanied by a bibliography of 173 titles, presents an excellent account of the junior high school as it existed in 1916. In the Appendix, particularly, will be found a general summary of the situation based on information from 100 American cities. The body of the volume discusses the general problems involved, the arguments for and against this type of school, its curriculum, its housing, and the characteristics of adolescence that it attempts to meet and utilize.

THE SIXTEENTH YEARBOOK, PART I (1917)

SECOND REPORT OF THE COMMITTEE ON MINIMAL ESSENTIALS IN ELEMENTARY-SCHOOL SUBJECTS

W. C. Bagley, W. W. Charters, F. N. Freeman, W. S. Gray, Ernest Horn,
J. H. Hoskinson, W. S. Monroe, C. F. Munson, H. C. Pryor,
L. W. Rapeer, G. M. Wilson, and H. B. Wilson

This yearbook is the 1917 report of investigators coöperating with the Committee on Economy of Time of the Department of Superintendence of the National Education Association, H. B. Wilson, chairman, and is the second printed report of that committee. It contains a further report on every subject discussed in the first report (Fourteenth Yearbook, Part I) and also a preliminary report on physical education. In this report the emphasis is upon the social value of the content of the several school subjects as a basis for the instruction given in them.

THE SIXTEENTH YEARBOOK, PART II (1917)

THE EFFICIENCY OF COLLEGE STUDENTS AS CONDITIONED BY AGE AT ENTRANCE AND SIZE OF HIGH SCHOOL

B. F. Pittenger

The author of this monograph sought by statistical methods to answer two questions: Is the quality of work done by college students affected by the age at which they enter or by the size of the high school from which they come? His results, based on a study of 828 students at the University of Minnesota, show, among other things, (1) that those entering before 18 years

of age did better work than those who entered at 18 or later, (2) that graduates of public schools did better work than graduates of military, private, or church schools, (3) that graduates of large schools did better work than graduates of small schools, (4) that the women did better work than the men, and (5) that elimination from the college, especially in the freshman year, is highly qualitative, in that the good students tend to remain and the poor ones to leave.

THE SEVENTEENTH YEARBOOK, PART I (1918)

THIRD REPORT OF THE COMMITTEE ON ECONOMY OF TIME IN EDUCATION

W. C. Bagley, B. B. Bassett, M. E. Branom, Alice Camerer, J. E. Dealey,
C. A. Ellwood, E. B. Greene, A. B. Hart, J. F. Hosic, E. T. Housh,
W. H. Mace, L. R. Marston, H. C. McKown, A. E. Mitchell,
W. C. Reavis, D. Snedden, and H. B. Wilson

This is the 1918, or third (printed) report of the Committee of the Department of Superintendence of the National Education Association on Economy of Time in Education, and is prepared by various coöperating investigators. Like the first and second reports, printed as yearbooks of this Society, it deals primarily with studies concerning the minimal essentials of various elementary-school subjects, including arithmetic, geography, reading, composition, civics, and history. A special feature of this report is a symposium on the purposes of historical instruction in the seventh and eighth grades, arranged by W. C. Bagley, and contributed to by Professors Dealey, Ellwood, Greene, Hart, Mace, and Snedden. With the exception of this symposium, the various articles in this yearbook deal with actual investigations of the content of the curriculum, especially in its relation to the needs of daily life.

VOLUME SIX

THE SEVENTEENTH YEARBOOK, PART II (1918)

THE MEASUREMENT OF EDUCATIONAL PRODUCTS

E. J. Ashbaugh, W. A. Averill, L. P. Ayres, F. W. Ballou, Edna Bryner,
B. R. Buckingham, S. A. Courtis, M. E. Haggerty, C. H. Judd,
George Melcher, W. S. Monroe, E. A. Nifenecker,
and E. L. Thorndike

The writers of this yearbook prepared it as representatives of the National Association of Directors of Educational Research (now the Educational Research Association) with the intent "to gather into one handy volume a rather complete statement of the various aspects of a new movement which seems destined to have a profound and permanent influence upon American Education." From the ready reception accorded the yearbook, it is not too much to say that this "rather complete statement" had, itself, a quite considerable influence in furthering the movement for educational measurement. Among the topics considered were: the history of educational measurement, the nature and purposes of such measurement, the organization of bureaus of research, a list of existing tests and scales, an exposition of statistical terms and methods, and suggestions for future development.

THE EIGHTEENTH YEARBOOK, PART I (1919)

THE PROFESSIONAL PREPARATION OF HIGH-SCHOOL TEACHERS

G. N. Cade, S. S. Colvin, Charles Fordyce, H. H. Foster, T. W. Gosling, W. S. Gray, L. V. Koos, A. R. Mead, H. L. Miller, F. C. Whitcomb,
and Clifford Woody

The first 160 pages of this "double number" are devoted to a description by H. L. Miller of the University of Wisconsin plan for the preparation of high-school teachers. Section II contains three chapters by Gosling, Colvin, Koos, and Woody on miscellaneous aspects of the problem of teacher-training. Section III, which the remaining contributors prepared, is a report of the Committee of the Society of College Teachers of Education on Practice Teaching for Secondary Teachers. The volume as a whole thus contains not only important analyses of prevailing conditions in the training of high-school teachers, but also suggestive accounts of several novel experiments looking toward the bettering of the deficiencies found to exist in the preparation of such teachers.

THE EIGHTEENTH YEARBOOK, PART II (1919)

REPORT ON ECONOMY OF TIME IN LEARNING: FOURTH REPORT OF COMMITTEE ON ECONOMY OF TIME IN EDUCATION

F. C. Ayer, F. N. Freeman, W. S. Gray, Ernest Horn, W. S. Monroe,
C. E. Seashore, and H. B. Wilson

This group of investigators operated as a sub-committee of the committee that was responsible for three preceding yearbooks bearing similar titles. The group took as its task the formulation of rules, or recipes, by which economy could be secured in education, not by better selection of topics for instruction (stressed in the preceding reports), but by improved methods of teaching which had been selected. The yearbook, accordingly, takes the form of a series of statements of fundamental principles which investigation, or the best expert opinion, has shown should be followed in teaching writing, reading, spelling, arithmetic, drawing, and music. This 'meaty' report has been much quoted and decidedly influential.

VOLUME SEVEN

NINETEENTH YEARBOOK, PART I (1920)

NEW MATERIALS OF INSTRUCTION

A Committee of the Society was created in 1918 under the title "Committee on Materials of Education," which had for its members Messrs. W. C. Bagley, J. C. Brown, C. E. Chadsey, L. D. Coffman, E. P. Cubberley, E. C. Elliott, H. C. Morrison, G. D. Strayer, G. M. Whipple, and C. H. Judd, chairman. With the coöperation of numerous persons this Committee assembled as their first report detailed examples of new materials of instruction, particularly in the fields of reading, geography, history, nature study, mathematics, and community life. The Committee stressed the importance of inducing school boards to set aside each year a certain amount of instructional energy for the purpose

of making similar new materials of instruction. (For further discussion of this topic, see the Twentieth Yearbook, Part I.)

NINETEENTH YEARBOOK, PART II (1920)

CLASSROOM PROBLEMS IN THE EDUCATION OF GIFTED CHILDREN

Theodore S. Henry

Dr. Henry summarized various types of flexible promotion schemes, described typical special rooms for gifted pupils, and then recounted at length the methods and results of an experimental room for gifted pupils organized at Urbana, Illinois. The closing chapters, in addition to a six-page bibliography, discuss the problem of adapting classroom methods to the training of gifted children, and present a series of eighteen specific recommendations for carrying on this type of educational endeavor. (For further discussion of this topic, see the Twenty-Third Yearbook, Part I.)

THE TWENTIETH YEARBOOK, PART I (1921)

SECOND REPORT OF THE SOCIETY'S COMMITTEE ON NEW MATERIALS OF INSTRUCTION

Frances Berry, Edna Keith, F. J. Kelly, W. N. Kerr, H. G. Lull, Nellie R. Olson, Nina Vandewalker, F. L. Whitney, and Numerous Collaborators

The Society's Committee (the same as that for the Nineteenth Yearbook, Part I), under the chairmanship of F. J. Kelly, appointed as sub-committee chairmen the persons listed above, who gathered and organized 295 detailed examples of new materials of instruction, and classified them for use in the kindergarten, the various elementary grades, the junior and the senior high school, and in special classes for the subnormal. These exercises, or 'projects,' all possess a degree of novelty and by the strong appeal they make to children are decidedly suggestive to teachers who are searching for material outside that of the regular textbooks or ordinary supplementary reading. This yearbook, like its predecessor on the same topic, may be regarded as a portion of the contribution made by this Society toward the reorganization of the curriculum.

THE TWENTIETH YEARBOOK, PART II (1921)

REPORT OF THE SOCIETY'S COMMITTEE ON SILENT READING

May A. Burgess, S. A. Courtis, C. E. Germane, W. S. Gray, H. A. Greene, Reginia R. Heller, J. H. Hoover, James A. O'Brien, J. L. Packer, Daniel Starch, W. W. Theisen, G. A. Yoakum, and Representatives of the School Systems of Cedar Rapids, Denver, Iowa City, and Racine

The Executive Committee of the Society appointed a Committee on Silent Reading, under the chairmanship of Earnest Horn, which gathered the material in this volume as its report. Section I comprises ten chapters concerned with investigations of various aspects of the problem of reading, as for instance, the difficulties encountered in teaching silent reading, the measurement of speed and comprehension of silent reading, the vocabularies and contents of readers, and the development of reading speed. Section II contains examples

of concrete exercises which have actually been tried in the classroom for teaching silent reading. This yearbook may be regarded as intermediate in scope and purpose between the several treatments of reading in the earlier yearbooks on minimal essentials and the economy of time and the elaborate treatment of reading in the Twenty-Fourth Yearbook, Part I.

VOLUME EIGHT

TWENTY-FIRST YEARBOOK, PARTS I AND II (1922)

INTELLIGENCE TESTS AND THEIR USE

S. S. Colvin, Helen Davis, Bessie L. Gambrill, Henry W. Holmes, W. K. Layton, W. S. Miller, Rudolph Pintner, Agnes L. Rogers, H. O. Rugg, M. R. Trabue, E. L. Thorndike, and G. M. Whipple

Under the chairmanship of the late S. S. Colvin, this Committee of the Society produced this yearbook of 270 pages in the attempt to explain "in a clear and accurate manner the theory, nature, and practical use of intelligence tests." Its two parts are bound in one cover. Part I treats of 'general intelligence,' its nature, how it may be measured, how mental tests have developed, and their essential characteristics. Part II treats in considerable detail "the administrative uses of intelligence tests in various grades, beginning with the primary grade and ending with the college and university." In addition to a wide circulation among schoolmen, this yearbook has been extensively used for purposes of instruction in normal schools and colleges.

TWENTY-SECOND YEARBOOK, PART I (1923)

ENGLISH COMPOSITION: ITS AIMS, METHODS, AND MEASUREMENT Earl Hudelson

By means of questionnaires the author sought to discover from teachers of English what their actual aims and methods were with respect to composition. He next considered the means employed for determining the extent to which these aims were being attained and was led to devise and to standardize two scales for the measurement of English composition. His principal contention is that most composition scales test only how well the pupil can write upon that particular topic, not how well he can possibly write. For the latter purpose he proposes his Maximal Composition Ability Scale. To determine accurately from time to time the extent to which the pupils are exercising their real ability, he proposes another device known as the Typical Composition Ability Scale. Detailed instructions are given for the use of these two scales.

TWENTY-SECOND YEARBOOK, PART II (1923)

THE SOCIAL STUDIES IN THE ELEMENTARY AND SECONDARY SCHOOL

A. S. Barr, J. J. Coss, Henry Harap, R. W. Hatch, H. C. Hill, Ernest Horn, C. H. Judd, L. C. Marshall, F. M. McMurry, Earle Rugg, H. O. Rugg, Emma Schweppe, Mabel Snedaker, and C. W. Washburne

This group of writers, under the direction of H. O. Rugg, has presented in this 324-page yearbook important and somewhat radical proposals concerning

the portion of the curriculum devoted to the social studies. Section I analyzes current practices, shows how social science curricula came to be what they are, and points out needed changes. Section II presents samples of reorganized courses in this field in several schools. Section III discusses the method by which such reorganizations of the curriculum should be carried on. Section IV is a critical appraisal of F. M. McMurtry of the proposed reorganizations. This volume may be regarded as one of several fore-runners of the proposed year-books on the Technique of Curriculum-Making. It applies, obviously, primarily to the geographical and historical portions of the curriculum.

VOLUME NINE

TWENTY-THIRD YEARBOOK, PART I (1924)

THE EDUCATION OF GIFTED CHILDREN

B. T. Baldwin, Helen Davis, Lillie R. Ernst, F. N. Freeman, T. S. Henry,
Ernest Horn, H. O. Rugg, L. O. Smith, L. M. Terman, C. W. Waddle,
and G. M. Whipple, chairman (the Society's Committee)

assisted by

J. R. Benson, E. R. Breslich, Arthur Brogue, Margaret V. Cobb, R. R. Cook,
J. C. DeVoss, Anna M. Engel, E. M. Haney, H. C. Hill, K. J. Hoke,
Leta A. Hollingworth, A. J. Martin, E. L. Moyer, Mary L.
Patrick, W. C. Reavis, Grace A. Taylor, H. G. Townsend,
C. W. Washburne, and W. L. Uhl

This extensive yearbook (443 pages of text) may be regarded as an attempt to gain further light and a more varied and comprehensive survey of the problem discussed in the Nineteenth Yearbook, Part II. Section I contains various reports and summaries of the more general aspects of the problem—the history of the movement for special training of the gifted, methods of locating such children, problems of organization and administration, the adaptation of the curriculum, non-intellectual traits of gifted children, etc. Section II presents numerous special studies of such children, with respect to their physical and mental traits, their educational achievements, their subsequent careers in the high school and university, and the outcomes of various school experiments in providing special training for them. Section III is a valuable annotated bibliography of 453 titles.

TWENTY-THIRD YEARBOOK, PART II (1924)

VOCATIONAL GUIDANCE AND VOCATIONAL EDUCATION FOR THE INDUSTRIES

A. H. Edgerton and Fifty Collaborators

This yearbook is one of the largest ever undertaken by the Society. The material for it was gathered and organized by Professor Edgerton from many sources and with the aid of half a hundred contributors. It affords, therefore, a comprehensive exposition of the present status of the branch of educational endeavor to which it is devoted. Section I, which deals with vocational guid-

ance, gives detailed accounts of what is already being done in various city schools systems, both large and small, and in colleges and universities, also accounts of methods of training vocational counselors. Section II deals with vocational education for the industries. It shows what is being done in typical part-time, or continuation, schools and in typical day and evening industrial courses in smaller cities. Further, there is discussion of the training of workers in industry, the training of foremen, and the training of teachers for vocational industrial schools. Both sections are supplied with bibliographies.

VOLUME TEN

TWENTY-FOURTH YEARBOOK, PART I (1925)

REPORT OF THE NATIONAL COMMITTEE ON READING

F. W. Ballou, W. S. Gray, Rose L. Hardy, Ernest Horn, Frances Jenkins,
S. A. Leonard, Estaline Wilson, and Laura Zirbes

Under the chairmanship of W. S. Gray, this Committee, appointed by Commissioner Tigert in January, 1923, subsidized by the Commonwealth Fund, and assisted by numerous school and university specialists, has used the avenue of publication afforded by this Society to present what is one of the most authoritative and most useful general discussions of the problem of reading that has been made available. Among the topics considered are: the aims of instruction in reading, a modern program of reading instruction for the elementary grades and the high school, methods of developing a meaningful vocabulary, the relation of reading to literature and the other content subjects, materials for instruction, standardized and informal reading tests, recognition of individual differences by diagnosis and remedial work. A feature of the book is the series of specific recommendations in which the members of the Committee, by discussion and experiment, have been able to concur.

TWENTY-FOURTH YEARBOOK, PART II (1925)

ADAPTING THE SCHOOLS TO INDIVIDUAL DIFFERENCES

Franklin Bobbitt, B. R. Buckingham, S. A. Courtis, W. S. Gray, Ernest Horn,
Jessie Mackinder, Helen Parkhurst, A. H. Sutherland, Mary A. Ward,
C. W. Washburne, chairman (the Society's Committee)

assisted by

Cecilia Anderson, R. N. Brown, Grace E. Carter, F. E. Clerk, Mary H. Comings,
U. J. Hoffman, Hilda M. Holmes, W. H. Holmes, W. H. Kilpatrick,
S. A. Leonard, J. L. McCrory, H. L. Miller, W. C. Reavis,
Margaret Smith, A. J. Stoddard, Elizabeth T. Sullivan,
L. Belle Voegelien, and W. A. Wirt

Section I of this important yearbook describes the factors which under ordinary school conditions tend to produce maladjustments of pupils with respect to grading and rate of progress. Section II follows with a description of typical attempts to meet these difficulties by adjusting the school's organiza-

tion and methods of instruction. Section III details statistical results of experiments in the individualization of instruction, with special reference to the work at Winnetka. Section IV discusses the various problems which are encountered in thus adapting schools, and Section V outlines the steps involved in launching a program of this sort. Section VI is a critique of these proposals, while Section VII comprises an annotated bibliography of 76 pages.

VOLUME ELEVEN

TWENTY-FIFTH YEARBOOK, PART I (1926)

THE PRESENT STATUS OF SAFETY EDUCATION

M. B. Hillegas, A. B. Meredith, Z. E. Scott, A. W. Whitney, S. J. Williams,
and G. M. Whipple, chairman (of the Society's Committee)

assisted by

Rena Allen, Mary N. Arrowsmith, Harriet E. Beard, Mary B. Day, Ruth C.
Earle, H. S. Gruver, J. H. Harvey, Max Henig, Evelyn T. Holston,
W. D. Keefer, Frances H. Miner, E. G. Payne, M. S. Pittman,
Mary O. Pottenger, Idabelle Stevenson, and Ruth Streitz

This yearbook represents the product of coöperation between this Society and the Education Division of the National Safety Council. It traces the development of the safety movement in industry, in the schools, and in civic administration, shows how safety education has been introduced into various school systems, presents at great length and in full detail the materials and methods of a program of safety education for the elementary schools, with additional suggestions for the adaptation and extension of this program for use in high schools, and in rural and vocational schools. The volume concludes with a general discussion of the significance of safety education and the outlook for its future development.

TWENTY-FIFTH YEARBOOK, PART II (1926)

EXTRA-CURRICULAR ACTIVITIES

F. C. Ayer, C. R. Foster, E. K. Fretwell, L. V. Koos, J. G. Masters,
M. C. Prunty, W. C. Reavis, Earle Rugg, and P. W.

Terry (the Society's Committee)

assisted by

E. H. Chappelle, F. Fickinger, C. E. Hagie, M. B. Horner, H. C. McKown,
C. J. Pieper, E. S. Simmonds, and Clifford Woody

Under the chairmanship of L. V. Koos, this Committee and its associates, by extensive canvassing of the country, has brought together a comprehensive statement of the present status of extra-curricular activities in the public schools of the United States. The Committee has not sought primarily to evaluate these varied activities or to prescribe rules for their inauguration or

control, but rather to state current practices with respect to such matters as honor societies, publications, student government organizations, debating, music, athletics, assemblies, and clubs of all kinds. These are discussed for elementary, for junior-high, and for senior-high schools. Special attention is paid to the relation of the teacher to these various enterprises.

VOLUME TWELVE

TWENTY-SIXTH YEARBOOK, PARTS I AND II (1927)

THE FOUNDATIONS AND TECHNIQUE OF CURRICULUM CONSTRUCTION

William C. Bagley, Franklin Bobbitt, Frederick G. Bonser, Werrett W. Charters,
George S. Counts, Stuart A. Courtis, Ernest Horn, Charles H. Judd,
Frederick J. Kelly, William H. Kilpatrick, Harold Rugg (Chairman),
George A. Works (Members of the Society's Committee)

Associated Contributors

Otis W. Caldwell, Walter D. Cocking, Ellsworth Collings, Flora J. Cooke, J. L.
Flanders, Harry O. Gillet, John A. Hockett, Marietta Johnson, Margaret
Naumburg, Jesse H. Newlon, Raymond W. Osborne, Henry Carr
Pearson, C. A. Phillips, Caroline Pratt, William C. Reavis, Ethel I.
Salisbury, E. M. Sipple, Eugene R. Smith, A. L. Threlkeld,
Carleton Washburne

From time to time, in a dynamic society it is imperative that we stand aside from the movement of affairs to review trends, to assay products, to map out new paths. The chief purpose of this Yearbook is a study and appraisal so far as agreement is possible of curriculum making in American schools—past and present.

For two years the Society's Committee was engaged in the development of one phase or another of the work, either in collecting and appraising the contemporary situation, in studying the chief trends of development in the past century or in prolonged round table conferences over similarities and divergences in educational theory.

This Yearbook presents three results of their efforts: a historical review, a description and evaluation of contemporary practices, and a statement of foundational principles for curriculum reconstruction.

Part I of this Yearbook attempts a description and critical synthesis of curriculum-making, past and present. Part II presents the committee's joint platform for curriculum-construction—a general statement of the foundational principles upon which the committee desires to see the next steps taken in the reconstruction of the school curriculum. Also the frank and interesting individual statements of the views of the several members of the committee.

VOLUME THIRTEEN

TWENTY-SEVENTH YEARBOOK, PART I (1928)

NATURE AND NURTURE: THEIR INFLUENCE UPON INTELLIGENCE

Lewis M. Terman, Barbara S. Burks, Truman L. Kelley, E. L. Thorndike,
Raymond R. Willoughby, Harold E. Jones, Helen L. Koch, Gladys G.
Tallman, Mildred Burlingame, Calvin P. Stone, Frank N. Freeman,
K. J. Holzinger, Blythe C. Mitchell, Agnes L. Rogers, Dorothy
Durling, Katharine McBride, Joseph Peterson, Katherine
Murdoch, Doris Maddow, Nettie L. Berg, Gertrude
Hildreth, Florence L. Goodenough, Carolyn Hoefer,
Mattie C. Hardy, Lois Doe-Kulmann, Arnold
Gesell, Janet A. Matthew, Bertha M. Luckey,
Katharine B. Greene, Mary L. Casey,
Helen P. Davidson, Doris I. Harter,
and Arthur I. Gates

Part I contains a very useful and important chapter furnished by Mrs. Herman Ramsperger of Stanford University on difficulties met in the statistical handling of the material of nature-nurture studies. Her section on the discovery and expression of degrees of causation among groups of dependent factors is particularly important, including as it does discussion of path coefficients and coefficients of determination. Other chapters contain a study of the intelligence of siblings by E. L. Thorndike of Teachers College, Columbia University, a comparison of white and negro children in rational learning by Joseph Peterson of George Peabody College for Teachers, a study of the effect of the nursery school upon intelligence by Florence L. Goodenough of the University of Minnesota, and a checking of the effects of training by A. I. Gates of Teachers College, Columbia University. These are grouped under seven heads: (1) Family resemblance; (2) intelligence and social environment; (3) race differences; (4) intelligence and schooling; (5) relation to health or physique; (6) constancy of the IQ; and (7) effects of coaching or special training.

TWENTY-SEVENTH YEARBOOK, PART II (1928)

NATURE AND NURTURE: THEIR INFLUENCE UPON ACHIEVEMENT

Lewis M. Terman, Leta S. Hollingworth, Margaret V. Cobb, J. D. Heilman,
Katherine M. Denworth, F. P. O'Brien, Howard Taylor, M. J. Van
Wagenen, William A. McCall, T. C. Holy, Lonzo Jones, G. M.
Ruch, L. Dewey Anderson, June E. Downey, Mark A. May,
Hugh Hartshorne, Guy M. Whipple, Joseph Peterson,
M. C. Barlow, P. R. Farnsworth, and Barbara S. Burks

The investigations of Part II of the Yearbook are grouped under five heads: (1) Achievement and intelligence; (2) achievement and school attendance; (3) achievement and teaching ability or school methods; (4) achievement and school expenditures; and (5) achievement and effort.

The basic question asked in Part II is as to whether (1) native ability or (2) public school experience determines levels of pupil achievement in school tasks. The most careful answer is offered in Chapter II, where J. D. Heilman of Colorado State Teachers College reports the use among a group of 828 ten-year old public school children in Denver of expressions of amount for (1) mental age, (2) school attitude, and (3) home status to determine school achievement in terms of educational age. He uses Sewell Wright's path coefficient method and finds that at least "50 percent of the variation in educational age" is due to heredity as measured in the study. School attendance alone accounts for but about 5 percent of the differences in school achievement found in his group of ten-year old pupils, and if the influence of school attendance in combination with mentality be added, not over 13 percent to 19 percent of educational age can be attributed to educational exposure. The implications of these findings for probable necessary length of elementary education are very apparent. The chairman of the Yearbook Committee, L. M. Terman, says, "Results such as those of Heilman open the question as to whether eight years of school attendance is really necessary to bring pupils up to the standard usually achieved by the eighth grade. One wonders whether in the four or five years between ten and fourteen they might not learn to read, write, and spell as well, and master as much arithmetic, history, and geography as they would be likely to in eight years."

VOLUME FOURTEEN

TWENTY-EIGHTH YEARBOOK, PARTS I AND II

PRESCHOOL AND PARENTAL EDUCATION

Prepared by the Society's Committee

B. T. Baldwin (deceased), Arnold Gesell, Patty S. Hill, Douglas Thom, Edna White, Helen T. Woolley, and Lois H. Meek (Chairman)

Assisted by

W. E. Blatz, Agnes Burke, Grace Caldwell, Lelah M. Crabbs, Bess V. Cunningham, Mary D. Davis, Charlotte G. Garrison, Ernest Groves, Sidonie M. Gruenberg, Ruth Haefner, Francis A. Hungerford, Harriet Johnson, H. E. Jones, Grace Langdon, Elizabeth Lord, Lawson Lowrey, Elizabeth Moore, Mary Murphy, Winifred Rand, Mae Raymond, Mandel Sherman, G. S. Stevenson, Mary Sweeny, Nell B. Taylor, Flora Thurston, Leona Vincent, Beth Wellman, C. A. Wilson, and Elizabeth Woods

The Twenty-Eighth Yearbook is the most significant contribution that has been made to the literature of preschool and parental education. A request for a yearbook in this field was made to the National Society for the Study of Education in February, 1925, and the committee was formally organized in October, 1925. Dr. Lois Hayden Meek, Educational Secretary for the American Association of University Women, was appointed chairman and the other members of the committee were chosen to represent various aspects of preschool and parental education; Dr. Bird T. Baldwin and Dr. Arnold Gesell,

research in child development; Professor Patty Smith Hill, education of young children; Miss Edna N. White, home economics aspect of preschool and parental education; Dr. Helen T. Woolley, psychological aspects of personality problems of childhood; Dr. Douglas Thom, the psychiatric aspect of child problems. A generous grant from the Lanra Spelman Rockefeller Memorial, supplementing the appropriation of the National Society for the Study of Education, made possible the work of the Committee.

The seven members of the Committee and the twenty-nine contributors associated with them, have assembled and presented in the Yearbook a most comprehensive survey of the present status of preschool and parental education. In setting forth the Committee's purpose for the Yearbook, Dr. Meek says in the introduction: "The Committee hopes that the present yearbook will help to show the trends of the movement, to point out the need for carefully trained personnel, to emphasize the varied influences of home, school and community life, and to focus attention on the total aspect of child development—physical, emotional and social, as well as intellectual." She further states that the Committee worked and thought together on practically every part of the book in an effort to unify the contributions of the many who supplied the wealth of data, and to present the material concerning the education of children and parents from a point of view which would integrate a movement participated in by many groups with varying objectives and backgrounds.

Throughout the book the term preschool refers "to the whole period of infancy and early childhood, from birth up to elementary school entrance at the age of six or seven." The term parental education is used "in its broadest sense to include all methods and devices of adult education intended to assist parents in the understanding and care of their children."

The book is divided into two parts—Part I on organization and development of preschool and parental education, and Part II on research and method in this field. In Part I, the history of the movement is given, including a brief discussion of the beginnings of the kindergarten, the Montessori school, the nursery school, child health centers, play schools and child study groups. The following general considerations underlying preschool and parental education are stressed: the importance of the preschool years from the standpoint of growth and development, the influence of home and parents, the need of supplementary educational agencies and fundamentally of educating parents themselves. The present organization of education for preschool children is given in considerable detail covering the family as an agency, day nurseries, maternity and infant welfare centers, the clinics, nursery schools and kindergartens. Part II also includes a survey of current programs in parental education and experiments in preparental training, and indicates what is being done in professional training for research and instruction in preschool education, in the professional training of nursery school teachers, and in the training of leaders in parental education.

Part II, on research and method, opens with research activities in the field of child development, indicating the present status of research in child development and citing the outstanding studies of motor, language, intellectual, emotional and social development and of physical growth. A section follows on educating preschool children, with a thorough discussion of child activities,

including those leading to the establishment of routine habits, play, art experiences, language and literature and social development. Provision for individual differences and the records of young children are also introduced. A concluding section deals with methods and materials for the education of parents and of practical ways of educating parents and teachers to the value of mental hygiene.

The Twenty-Eighth Yearbook is a very valuable source book in the field of preschool and parental education—a book which administrators, supervisors, teachers and parents interested in general or specialized education for the preschool child or the parent will find an indispensable addition to their libraries.

VOLUME FIFTEEN

TWENTY-NINTH YEARBOOK, PARTS I AND II (1930)

REPORT OF THE SOCIETY'S COMMITTEE ON ARITHMETIC

W. A. Brownell, B. R. Buckingham, G. T. Buswell, C. E. Greene, R. L. West,
F. B. Knight, (Chairman)

Assisted by

E. A. Beito, J. C. Brown, L. J. Brueckner, J. R. Clark, W. F. Dearborn,
Arthur Edwards, H. L. Harap, Ernest Horn, C. H. Judd, Fred Kelly,
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Florence Stratemeyer, and C. W. Washburne

The Twenty-Ninth Yearbook of the National Society for the Study of Education was prepared by the Society's committee on arithmetic, of which F. B. Knight is chairman, and the membership includes W. A. Brownell, B. R. Buckingham, G. T. Buswell, C. E. Greene, and R. L. West. Thirty other active members of the Society assisted the committee in the preparation of this 700 page report, or acted as a special reviewing committee, whose critique of the work as a whole appears at the end of the Yearbook.

The Twenty-Ninth Yearbook is divided into two parts. Part I, *Some Aspects of Modern Thought on Arithmetic*, contains an article on "The Social Value of Arithmetic," by B. R. Buckingham; one on "The Arithmetic Curriculum," by West, Greene, and Brownell; on "Some Considerations of Method," by F. B. Knight; on "Testing and Diagnosis," by Greene and Buswell; and on "The Training of Teachers," by B. R. Buckingham.

Part II, *Research in Arithmetic*, contains a study of techniques by W. A. Brownell, a critical survey of previous research in arithmetic, by G. T. Buswell, and reports of eleven hitherto unpublished studies on various pertinent topics. The Appendix contains a *Critique of the Yearbook* by the reviewing committee, Leo J. Brueckner, chairman.

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